WESTERN INDUSTRY

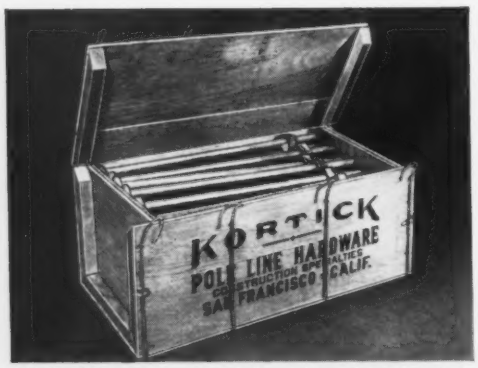
ANUARY
950 VOLUME XV
NUMBER 1

annual

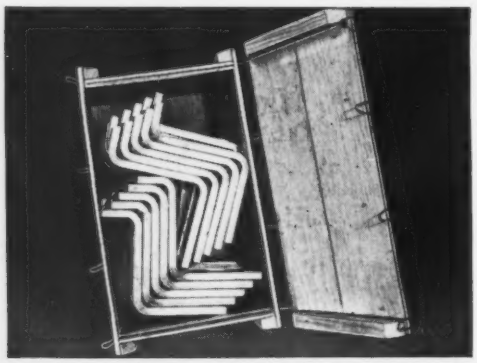
REVIEW & FORECAST

MA 1-32w

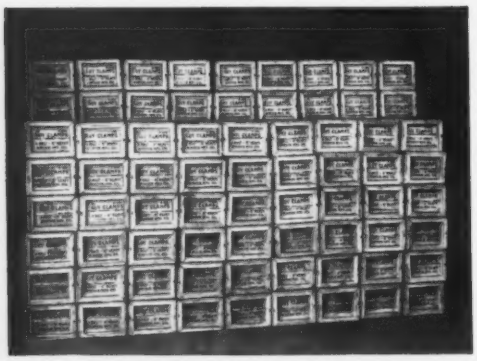
SAVES FOR AN ENTIRE INDUSTRY!



HEAVY BOLTS—75 pounds of them, ship safely, securely in a Cabco all-bound weighing barely 4 pounds.



SHIFTING of load inside container makes little difference to Cabco all-bound. No nails to work loose; steel wire holds container securely together, prevents loss.



WAREHOUSING is simple with Cabco all-bounds. They stack neatly, palletize easily, have cleats for manual handling. Ready instantly to fill an order, or go out on the job.

POLE LINE HARDWARE INDUSTRY STANDARDIZES ON WIRE-BOUND BOXES FOR HEAVY, BULK SHIPMENTS

As a result of 3 years of research and study, the pole line hardware industry has standardized on wire-bound wooden containers for bulk shipments of heavy castings and forgings. Here's what Kortick Manufacturing Co., San Francisco, says about the changeover:

"Our new containers, made for us by Cabco, average 4 pounds against the 8-pound nailed crate we once used. Since we ship actual weight, this is important. We once used 28 different nailed crates; now 15 Cabco all-bounds do the job better and cost less. Packing time is less too, and since tops don't have to be nailed shut, we can leave crates open for last-minute inspection without delaying loading. The Cabco all-bound has no nails to work loose, so even if the load shifts inside, the container stays solidly together. And these boxes handle and stack better than any container we've ever used!"

IN MANY OTHER INDUSTRIES,

from Fruit & Produce to Consumer Durables, shippers have enjoyed similar economies with light, strong Cabco all-bounds—a product of the West's oldest, foremost manufacturer of wooden containers.

Find out how Cabco all-bounds can help you! Investigate Cabco's container design service. Write direct to exclusive sales agents:

DUFF CALIFORNIA CO.

Sawn Shook, Barrels, Veneer Covers and All-Bound Containers

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1970

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THIS IS OUR 66TH YEAR

CALIFORNIA BARREL COMPANY, LTD.

OFFICES: SAN FRANCISCO, LOS ANGELES and ARCATA, CALIFORNIA
SALT LAKE CITY, UTAH • PLANTS: ARCATA, SAN FRANCISCO, LOS ANGELES

TOP TO BOTTOM: VICTOR 100 Series welding torch butt and C1450-100 cutting attachment. New 4000 Series machine cutting torch. New stainless steel Model 362 descaling attachment, multiflame preheating nozzles, Type 3 welding nozzles, and 320 torch extension for use with 300 Series welding torch butt (shown at lower right). Attachment or nozzle change quickly made without wrench.

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FLEXIBLE, VERSATILE WELDING and CUTTING UNITS

VICTOR

Hard-surfacing rod. Regulators for all gases. Machine and hand torches for welding, preheating, cutting, flame hardening and descaling. Portable flame cutting machines. Blasting nozzles. Cylinder manifolds. Cylinder trucks. Emergency pack-type flame cutting outfits. Fluxes. Write today for free descriptive literature.

It's easy to custom-build your outfit from* VICTOR *standard torch butts, attachments, nozzles, and tips.

Among VICTOR'S standard units you will find the right combination for all your cutting and welding operations, scarfing, deseaming, rivet piercing, hard surfacing. Furthermore, it is economical and easy to expand your VICTOR outfit to fit new needs.

Your VICTOR distributor will gladly help you custom-build an outfit for your specific job requirements. See him NOW.

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the SOURCE you can depend on for all your Piping Needs

How CRANE is set up to give you better service

Take the water supply piping shown here, for instance. First, in one **complete line,** Crane gives you the largest selection of equipment—**valves, fittings, pipe line accessories, and pipe.** The Crane Catalog makes it easy to specify—**easy to order**—all piping materials for your installation.

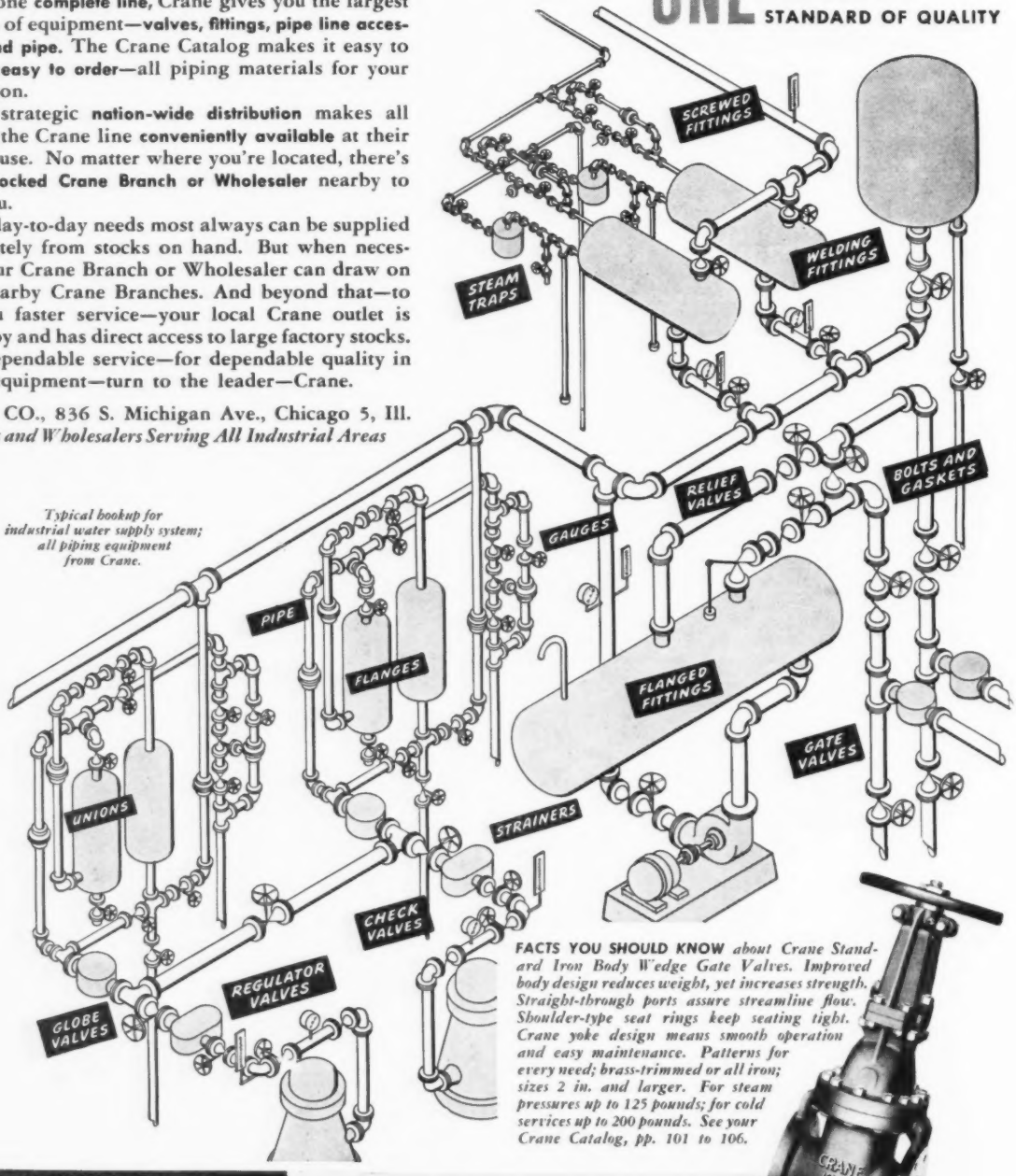
Next, strategic **nation-wide distribution** makes all items in the Crane line **conveniently available** at their point of use. No matter where you're located, there's a **well-stocked Crane Branch or Wholesaler** nearby to serve you.

Your day-to-day needs most always can be supplied immediately from stocks on hand. But when necessary, your Crane Branch or Wholesaler can draw on other nearby Crane Branches. And beyond that—to give you faster service—your local Crane outlet is backed by and has direct access to large factory stocks.

For dependable service—for dependable quality in piping equipment—turn to the leader—Crane.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



Typical hookup for industrial water supply system; all piping equipment from Crane.

FACTS YOU SHOULD KNOW *about Crane Standard Iron Body Wedge Gate Valves. Improved body design reduces weight, yet increases strength. Straight-through ports assure streamline flow. Shoulder-type seat rings keep seating tight. Crane yoke design means smooth operation and easy maintenance. Patterns for every need; brass-trimmed or all iron; sizes 2 in. and larger. For steam pressures up to 125 pounds; for cold services up to 200 pounds. See your Crane Catalog, pp. 101 to 106.*

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This Month in WESTERN INDUSTRY

VOLUME XV JANUARY, 1950 NO. 1

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Front Cover

The big change in Western industry accelerated by the war was the arrival of heavy industry in the West, with great expansion in steel facilities as the foundation. Scene shows bottom pouring of molten steel into molds at the South San Francisco plant of Bethlehem Pacific Coast Steel Corporation.

Now! NEW INSULATED FRUEHAUF TRUCK BODIES

Mounted on Your Chassis! Painted to Your Specifications!

AS LOW AS

$1,052

(freight and taxes extra) 12-ft. straight frame with full-width, full-height doors — complete — painted and mounted.

NOW you can buy a fully-insulated Fruehauf Van Body. They're built to the same high standards as Fruehauf's famous "Reefer" Trailer — yet priced as amazingly low as $1052. This is the price of the handsome 12-ft. straight-frame model *shown above.* Yes, complete—mounted and painted—for *only* $1052!

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Fast delivery! Within a few hours of the time you select your Body, your Fruehauf Branch will have your new truck ready for the road.

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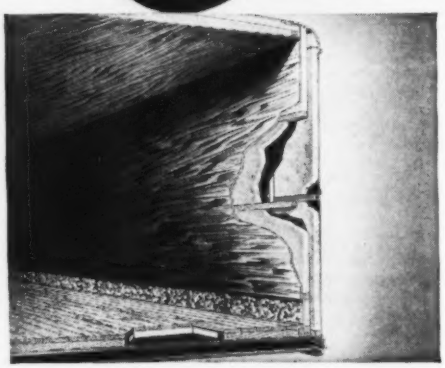
FRUEHAUF *Truck Bodies*

Custom Quality at Production-Line Prices!



ALL STEEL! FULLY INSULATED!

Insulated construction provides complete protection for perishable cargo. **This cutaway shows you how 3" layer of insulation is fitted in sides, ceilings and doors . . . an adequate 1½" layer below floor.**

2 BASIC MODELS

1. **Wheelhousing—in 12-ft. and 14-ft. lengths.**
2. **Straight-frame—in 12-ft., 14-ft. and 16-ft. lengths.**

ALL THESE OPTIONS

1. **Full width Rear Doors (82" openings).**
2. **Narrow Rear Doors (41" opening).**
3. **Outside Tailgate (19" or 24").**
4. **Double Curbside or Roadside Doors (41" opening).**
5. **Single Curbside Door (41" opening).**
6. **Mounting Bracket and Opening for Ice Refrigerating System.**

IN OUR MAILBOX

That Added Market

Editor, Western Industry:

It was of considerable interest to me to read Mr. Stanbery's article commenting on the changes that are taking place in the Pacific Coast economy, and I think his conclusions are certainly valid. Woodfiber products in particular are largely tied to the Western market, and that note in which he confidently expects that we will have a growing market out here for at least two generations is therefore of interest to us.

CHAS. E. DEVLIN
General Sales Manager
Simpson Logging Company
Seattle, Washington

Editor, Western Industry:

In our estimation, the article in your October issue "Your Added Market on the Pacific Coast" provides the most accurate picture of developments in this area and of probable developments within the next ten years that has been brought to our attention.

J. L. S. SNEAD, JR.
Executive Vice-President
Consolidated Freightways, Inc.
Portland, Oregon

Many Thanks, Mr. Buchman

Editor, Western Industry:

May I congratulate you on the excellence of your publication. I can offer no suggestions for improving the caliber of your editorials, as to my knowledge they have always been constructive, varied and of general interest.

LOUIS BUCHMAN
General Manager
Western Mining Divisions
Kennecott Copper Corporation
Salt Lake City, Utah

Good Picture of the West

Editor, Western Industry:

I have had several copies of WESTERN INDUSTRY, including the December issue just received, and I wish to congratulate you on this very interesting and informative publication.

If it is not imposing on you too much, I would like very much to have our Vice President and Director of Sales receive copies of your magazine. He is a Californian and interested in West Coast development, and I know of no better way to keep him advised.

WALTER L. LESHANDER
Remington Rand, Inc.
Los Angeles, Calif.

Promoting the West

Editor, Western Industry:

We certainly appreciate the opportunity of appearing on the cover of your publication and think that you have done a very excellent job. It is always interesting to us to see the development and promotion of Western industry, as many times on a nationwide scale people are rather inclined to overlook us.

LARRY NELSON
Sales Manager
Portland Woolen Mills, Inc.
Portland, Oregon

EDITORIAL COMMENT

Inventory Time

FEW American business firms would survive if they failed to take stock at the first of the year of their assets and liabilities resulting from past operations, and neglected to study the prospects for the future. From these guideposts may be ascertained the direction which immediate programs and long-range planning should take.

Because we feel that the area generally known as "The West," namely, the eleven Western states, requires the same sort of regular stock-taking, the January issue of WESTERN INDUSTRY has been made an annual review and Forecast Number. Its purpose is to assist the West in some measure to get an over-all picture of how far it has gone, and what its strength and weaknesses are, in order that industry in these states may thereby plot its future more accurately and profitably.

If the West were a long-settled area whose thought was tied in large measure to the past, its future would be much more prescribed and circumscribed, and a stock-taking far less necessary. But the West is new, in age, in thought, in problems, in potentialities. It is the new base of the United States, whose influence on the economy and thinking of the country will be felt in increasing measure in the coming years.

Here man creates his opportunities by overcoming the obstacles imposed by geography and geology. To be sure, in the gold rush days he said "Gold is where you find it," but today he finds treasure in visualizing new possibilities. For example, he does not say "Water is where you find it," but rather, "Water is where you put it."

Ahead of the West lies a greater growth that may be far beyond today's expectations. Some say the Westward population of the last decade cannot be equaled, that it must inevitably slow down. Yet who, at the outset of the war, or even at the very end of it, foresaw that the last half of the present decade would bring as much growth for the West as the war years of the first half? The West needs just as much to prepare for a decade just ahead of equal or even greater growth, as it does for a tapering-off period.

The population base already established inevitably calls for more convenient forms of service than can be provided by far-distant industrial establishments east of the Mississippi River, to say nothing of the demands imposed by a much larger population in 1960 and 1970. Not only will the Pacific Coast states find their industrial economy quickening to keep pace with the population, but the intermountain area will be far closer to good markets than ever before, with corresponding benefits.

Long and Short of It

WHILE the Hoover Commission is still at it, we suggest they perform an even greater service for humanity and promote a consolidation of the long and short ton, thereby doing the world in general, and statisticians in particular, a big favor. Now that the nations between them have agreed to standardize on screw threads, it becomes evident that they could make a ton a ton, if they would. Perhaps they could even make a dollar a dollar. Who knows?

ARE YOU MAKING THE BEST USE OF THIS MAN'S SERVICES?

Too often, an employer doesn't take full advantage of the expert services offered by his insurance agent or broker. He is a specialist, for example, in the field of employee-security plans. He is qualified to help you choose the *best* plan of group insurance for your organization. Take full advantage of his knowledge and experience. Call him into the picture today!

GET *Better* ACQUAINTED WITH YOUR INSURANCE AGENT OR BROKER!

He Can Be a Valuable "Key-Man" In Your Business

This message published by one of the recognized companies underwriting modern group insurance plans—
CALIFORNIA-WESTERN STATES LIFE INSURANCE COMPANY

MAIL BOX—*(Continued from page 7)*

Copper Furnace Brazing

Editor, Western Industry:

A reprint of one of your articles from your March, 1949 issue "Copper Furnace Brazing Useful in Metal Combination" has recently come to our attention. We should like to inquire about the cost of obtaining 50 reprints fo this article for our technical files. Thank you for your cooperation in this matter.

JAMES H. HINMAN
Technical Advisor, New Bedford Div.
Revere Copper and Brass Incorporated
New Bedford, Mass.

Editor, Western Industry:

An article titled "Copper Furnace Brazing" which appeared in your March issue has been called to our attention by Revere Copper & Brass, Inc. If possible, we should like to obtain a copy of this article.

CARNESS F. RAMEY
Industrial Electric Mfg. Co.
Allegan, Michigan

Voice From Colorado

Editor, Western Industry:

I am glad to see this periodical, which, it seems to me, is doing a very fine and necessary job.

H. F. WALTON
Professor of Chemistry
University of Colorado
Boulder, Colorado

Hits the Mark

Editor, Western Industry:

Your editorial comment ("Counter-Intelligence Vital," November *Western Industry*) is very good, and I think very timely, too.

N. HENRY GELLERT
President, Seattle Gas Company
and Pres. Pacific Coast Gas Assn.

CALENDAR OF MEETINGS

Jan. 18 - 20 — American Management Assn., general management conference, St. Francis Hotel, San Francisco.

Jan. 19-21—Colorado Society of Engineers, Shirley-Savoy Hotel, Denver

Jan. 20-21—Idaho Society of Engineers, Boise

January 27—West Coast Lumbermen's Association, at Portland, Ore. Contact H. V. Simpson, 1410 S.W. Morrison, Portland, BE 5177.

January 27 - 28 — Second Industrial Engineering Institute, University of California, Berkeley. Contact: D. G. Malcolm, Dept. of Mechanical Engineering.

February 2-4—Colorado Mining Ass'n, annual meeting, Shirley-Savoy Hotel, Denver.

February—Oregon State Bottlers Association, Benson Hotel, Portland, Ore. Contact Earl Tweedmeyer, B-1 Bottling Co. of Oregon, 1327 S.E. Division, Portland, EA 0191.

February 24—California Stripper Well Association, at Los Angeles.

February, last week — N. W. Association of Ice Industries, Tacoma, Wash. Contact P. P. Pierson, MA. 8161, Tacoma.

March—Pacific N.W. Advisory Board, at Portland, Ore. Contact F. T. Westmeyer, 624 Vance Bldg., Seattle, Wash.

March 12-14—Northwest Canners Association (corrected date), Multnomah Hotel, Portland, Ore. Contact A. L. Hobart, 514 Board of Trade Bldg., Portland, AT 7569.

Here's How To:
• Cut Your Floor Maintenance Costs
• Reduce Slipping Accidents
• Improve Your Products
FOOT SAFETY IN EVERY FOOT
Grip without a slip!
Easy to clean!
Easy to Match!
Install A.W. Super-Diamond Rolled Steel Floor Plate in your plant and you eliminate floor maintenance bills and costly slipping accidents. It requires no maintenance, and the exclusive engineered Super-Diamond Pattern "grips without a slip" keeping men's feet safe and secure. A.W. Super-Diamond improves products too. On machine tool bases, saddle tanks, lift trucks and on heavy construction equipment, both stationary and mobile, it guards against slipping accidents. Architects, product engineers, safety engineers and purchasing agents everywhere specify Super-Diamond for safety.
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BWH

DEPENDABLE RUGGEDNESS

BULL DOG V-BELTS demonstrate how to get the most out of V-Belts

Fractional Horsepower (FHP)—V-Belts in three standard sections, full range of lengths.

WEAR-RESISTANT COVER, protects heart of belt from dirt, grease, moisture.

COMPRESSION SECTION, engineered to withstand continual flexing.

BULL DOG CORDS, powerful load-carrying section.

Industrial V-Belts in A, B, C, D and E sections — full range of lengths from 26"-660".

OUTSTANDING ADVANTAGES OF BULL DOG V-BELTS

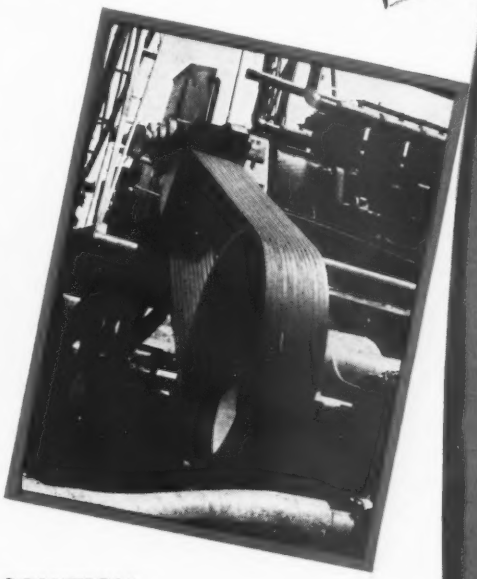
1. Fewer Maintenance Headaches. Because BULL DOG V-BELTS require less adjusting and last longer, they save time, money and worry in maintenance.

2. Longer Belt Life. Because new, quality-controlled compounds developed in BWH laboratories run cool, don't crack or deteriorate under severe flexing.

3. Backed by BWH Reputation for Extra Service. In the 72 years that BWH has been a leader in the mechanical rubber manufacturing field, BWH products have built steady fame for outstanding performance. BULL-DOG V-BELTS fully live up to BWH reputation for dependable ruggedness.

Efficient V-Belt operation insures steady, smooth, low-cost power transmission, without maintenance worries, over long periods of time. And that's exactly the kind of economical, worry-free service BULL DOG V-BELTS deliver in all types of industry.

Each job has its own problems, however. Here are some of the common ones that engineers report in V-Belt operation, with BWH solutions:



PROBLEM	SOLUTION
Excessive Cover Wear on V-Belts	Check sheaves for worn grooves. Check alignment between sheaves. Check to see that sheaves are tight on shafts.
Covers Loosen . . Rubber Gets Soft and Sticky	Check for excessive oily conditions. If contact with oil or grease cannot be prevented, then specify BULL DOG HSO V-BELTS, which are oil resistant. (Also heat resistant and static conducting.)
V-Belts Failing Within Few Hours of Installation	This is usually caused by prying V-Belts over edge of sheaves, causing internal cords to break. Correct method of installation is to move motor of driven machine until belts do not have to be forced onto sheaves. Then move motor back until sufficient tension is applied.
New V-Belt Installed As Replacement Fails, While Old Belts Continue Running	Never install a new belt in a set of old belts, because it will be either shorter or longer than the old belts. If shorter, it will be excessively overloaded and fail. If longer, it will not transmit an equal share of the load. Always install a complete new set of belts and retain old belts for an emergency, or for temporary replacement if needed.

It will pay you to investigate BULL DOG V-BELTS on your next installation. They have what it takes for smoother operation on both FHP motors and on high-powered industrial jobs.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems. We're specialists in solving them. Consult your nearest BWH distributor or write us direct.

BWH
DEPENDABLE RUGGEDNESS

FOR ALL MECHANICAL RUBBER GOODS CONSULT BWH

Established in 1878, BWH is today one of the world's largest manufacturers of mechanical rubber goods. Among the quality-famous BWH products which are today helping industry to do better jobs at lower cost are the following:

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Another Quality Product of

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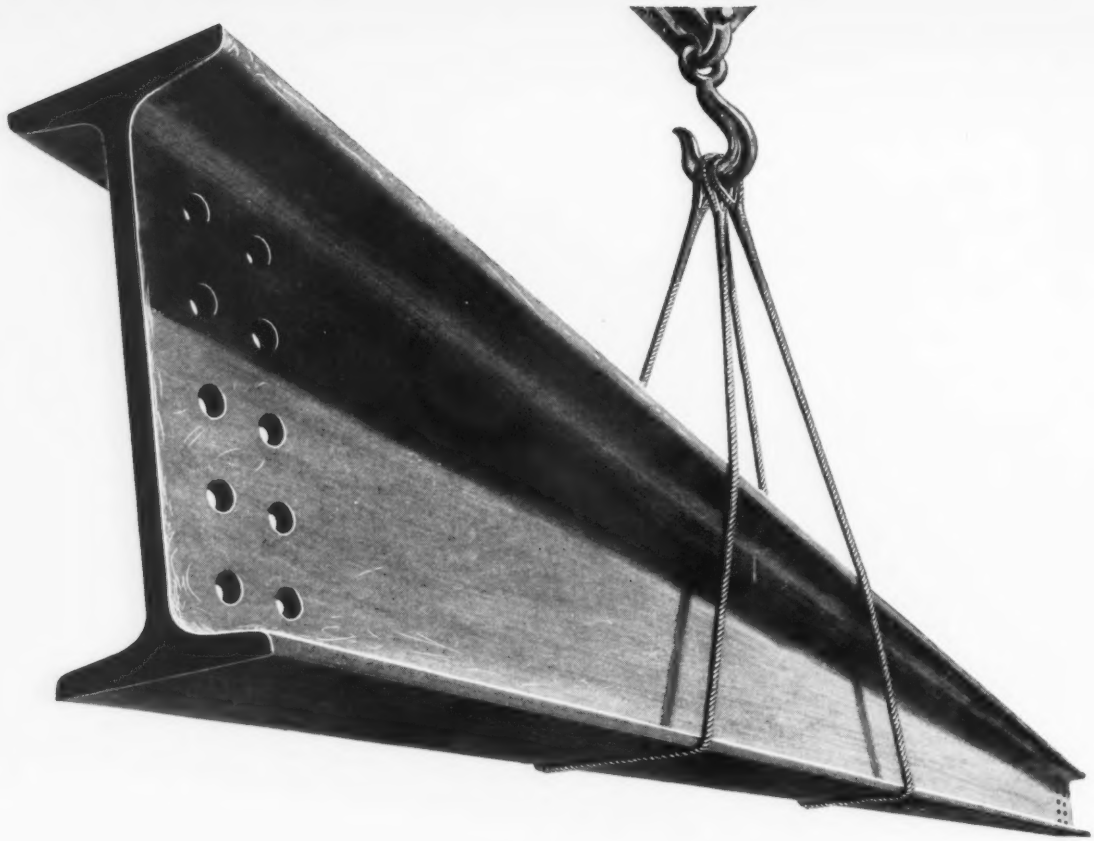
Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS., U.S.A.



2,700 tons of steel...every 24 hours!

Once around the clock . . . and 2,700 tons of steel ingots are produced at Kaiser Steel's mammoth Fontana plant.

That would make enough structural shapes to erect a 12-story building. Or enough plate to build one coastal freighter. Or enough pipe to supply 3,400 homes. *Every 24 hours!*

More evidence that the West's only integrated *independent* steel plant is bringing more industry, more jobs, more wealth to the West!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip hot rolled sheet • alloy bars • carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels pig iron • coke oven by-products • For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE**

THE WESTERN OUTLOOK . . . News • Statistics 1

Building operations firm; No brownout in sight; Steel outlook is good; Aircraft pinched in federal budget; Lumber in strong hands; Plywood perks; Pulp mills are back on full time; Canned goods sell fairly well

LAST month on this page a much-perplexed Western industrialist was pictured staring hard into a crystal ball and disgustedly turning his back on a wall chart with enough zig-zags on it to confuse even the Stanford Research Institute (although perhaps not Pappy Waldorf). Really to find what was in the crystal ball our worried friend should study carefully the entire contents of this Review and Forecast Number of WESTERN INDUSTRY. He may not find all the answers, but he is bound to discover many that do not appear elsewhere in print.

These answers are mostly on the long-range side. For the short-run, the kind needed to eke out a first down, there is the fact that people are still seeking places to live, which means a goodly demand for door-knobs, garbage cans, floor furnaces and allied items for a long time to come.

Security-First National Bank says southern California building permits made a spectacular record in October, exceeded in three months in 1948, but other than that unequaled since 1923. First eight months of 1949 were consistently below 1948 levels, and the first ten months showed 13½ per cent reduction in dwelling units for which permits were issued in Los Angeles County. Wells Fargo Bank reports that building permits in the whole state, for the first time in 14 months, were greater in October than a year earlier.

For the first eight months of the year, building permits in Washington cities were down 1.6 per cent, according to Seattle-First National Bank. For Oregon, Washington and Idaho combined, Equitable Savings & Loan Association, Portland, gives the number of permits for the third quarter of the year as up 15 per cent from a year ago, and a 7 per cent decline in value which is less significant in view of the issuing of a permit for a $3,000,000 apartment building in the third quarter of 1948.

Utah's total building permits for October 1949 were $4,300,000, compared with $3,400,000 in 1948, according to the Bureau of Business & Economic Research, University of Utah. Third quarter building permits for Phoenix, reported by Valley National Bank were 42.4 per cent up from corresponding period in 1948, but Tucson was off 22.4 per cent.

Business Activity Indices in Per Cent of 1935-39 Average

(Taken as basis of 100)

	August	September	October
[1]Arizona	316.0	312.0	315.7p
[2]California	219.9	226.5	224.6p
[3]So. California	268.8	272.0p	272.0p
[4]Pacific N.W.	210.8		
[4]Puget Sound	203.5		
[4]Inland Empire	193.7		
[4]Lower Columbia	228.4p		

1) Valley National Bank (Phoenix) index, based on a weighted composite of retail sales, agricultural income, and employment in mining, manufacturing and construction, and seasonally adjusted. 1940 = 100.
2) Wells Fargo Bank & Union Trust Co., index based on the following components: Industrial production, freight carloadings, bank debits, department store sales (weighted 4, 3, 2, 1, respectively, and adjusted seasonally).
3) Security-First National Bank of Los Angeles index, based on the following components and weights, and adjusted seasonally: department store sales, 15; building permits, 5; Los Angeles bank debits, 20; residential city bank debits, 5; agricultural city bank debits, 5; industrial employment, 20; industrial power sales, 13; railroad freight volume, 6; telephones in use, 7; real estate activity, 4.
4) Index compiled by Bureau of Business Research, University of Washington. Basis of compilation not indicated.
p) Preliminary estimate.

In fact, a large part of the whole Western economy seems to hinge on the population growth, and while the heavy load of winter unemployment puts burdens on state and local governments it does not affect the economy as would unemployment in other parts of the country because employment itself has not diminished greatly.

The big conference on unemployment staged by Governor Warren of California at Sacramento early in December brought out no hidden facts in the situation; merely

(Continued on page 15)

BANK LOANS

Industrial, commercial and agricultural
(In millions of dollars)

From weekly reporting member banks of Fed. Res. System in 7 western cities: L.A., S.F., Portland, Seattle, Tacoma, Spokane, and Salt Lake.

(Average of Wednesday reports)

1949	
June	2,003
July	2,416
August	**1,920**
September	1,956
October	1,961
November	1,999

BANK DEPOSITS

(In millions of dollars—adjusted)

Daily average month, all member banks in 12th Federal Res. Dist. Demand deposits excluding U. S. Gov't deposits, cash items in process of collection, and interbank deposits.

1948	Net Demand Deposits	Time Deposits
August	8,453	6,178
September	8,626	6,178
October	8,714	6,184

FREIGHT

Cars of revenue freight, railroad carriers in 11 Western states.

(Compiled from Assn. of Am. R.R. weekly reports)

	Carloadings		Received from Eastern Connections	
	1948	1949	1948	1949
May	656,333	631,651	350,986	348,190
June	593,121	566,042	303,680	280,659
July	588,842	532,120	287,565	260,419
August	766,432	681,602	376,674	341,628
September	628,156	550,529	321,399	284,265
October	659,069	553,399	351,521	286,163

*5-week period.

TRUCK TRAFFIC

(Number of commercial trucks entering state through border checking stations)

	—CALIFORNIA—		— ARIZONA —	
	1948	1949	1948	1949
June	14,816	15,365	19,312	21,504
July	14,763	14,774	19,557	21,465
August	15,203	16,207	19,078	21,004
September	14,777	15,727	18,880	21,256
October	15,892	16,615	20,751	23,832
November	14,789	16,360	20,401	23,116

MANUFACTURING EMPLOYMENT

Estimated Number of Employees—Source: U. S. Bureau of Labor Statistics and State Agencies

	WASHINGTON		OREGON		CALIFORNIA		TOTAL PACIFIC	
	1948	1949	1948	1949	1948	1949	1948	1949
August	183,100	171,500*	156,000	138,200	772,800	757,900	1,111,900	1,067,600
September	189,900	173,700	121,500	138,700	802,900	752,600	1,114,310	1,065,000
October	188,650	167,900	.....	.....	769,200	737,600	.....	.....

*Preliminary.

	MONTANA		IDAHO		WYOMING		COLORADO		NEW MEXICO		ARIZONA		UTAH		NEVADA		TOTAL MTN.	
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
August	18,000	18,900	25,400	21,700	6,900	6,400	.....	.....	9,850	10,300	15,100	14,200	29,400	29,700	....	....	.....	.....
September	18,100	19,100	26,700	21,700	6,800	6,200	.....	.....	9,850	10,500	13,900	14,200	33,000	33,000	....	....	.....	.....
October	18,100	20,700	24,300	22,400	7,240	7,700	...	....	9,500	10,600	14,800	14,700	.....	.....	3,400	3,000	.....	.....

*Revised.

INSURED UNEMPLOYMENT

(Under all programs: figures in thousands. From Social Security Board)

Week ending	Ariz.	Colo.	Idaho	Mont.	Nev.	N. Mex.	Utah	Wyo.	Total Mtn.	Calif.	Ore.	Wash.	Total Pacific
Aug. 27	7.3	5.4	1.4	2.3	1.7	3.0	4.7	.6	26.4	223.0	18.8	32.2	274.0
Oct. 1	6.1	4.0	2.3	2.0	2.0	2.2	4.4	.5	23.5	192.9	17.8	31.6	242.3
Oct. 29	6.0	8.7	2.9	2.5	2.0	2.3	5.7	.8	30.9	200.5	23.7	41.2	265.4

Fastener appearance that contributes to the sales appeal of the final product—helps you get *True Fastener Economy*. The exceptionally fine finish of RB&W Cap Screws and Square Head Cup Point Set Screws is the product of more than a century of continuous research and progressive development in fastener manufacturing . . . backed by the skill of four generations of RB&W men and women.

R B & W

THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

THE WESTERN OUTLOOK . . . News · Statistics 2

WHOLESALERS' SALES

In thousands of dollars. Percentage changes are from corresponding month of preceding year. From Bureau of the Census.

MOUNTAIN

	Automotive Supplies	Change	Electrical Goods	Change	Furn. and house furn.	Change	Groc. and foods exc. farm prod.	Change	General Hardware	Change
August	2,208	— 2	3,432	— 7	473	+35	....	....	2,212	— 3
September	820	—15	3,580	— 16	490	+19	....	....	2,120	—12
October	1,050	—10	3,322	— 9	717	+ 3	....	....	2,266	—14

PACIFIC

August	2,430	—20	12,372	— 18	....	....	11,182	....	5,908	—26	2,065	—14	1,650	—22
Sept.	1,725	—24	15,067	— 16	1,695	— 4	15,295	....	6,863	—14	1,867	—23	1,948	— 9
October	2,508	—10	12,157	— 15	3,137	— 9	8,705	....	7,567	—13	2,057	—14	2,019	+ 1

	Mch. equip. and supplies excl. elec.	Change
August	328	—29
Sept.	414	—24
October	429	—23

*Full-line wholesalers.

CONSUMERS' PRICE INDEX

From Bureau of Labor Statistics
100 = 5 yr. Avg. 1935-39

	Los Angeles	San Francisco	Portland	Seattle	Denver
Aug. 15	166.8	....	....	170.8	....
Sept. 15	167.1	173.0	....	....	....
Oct. 15	166.5	....	173.6	....	164.6

INDEX NUMBERS OF WHOLESALE PRICES BY GROUPS OF COMMODITIES AND BY MONTHS

Bureau of Labor Statistics, Washington 25, D.C.
(1926 = 100)

1949	Farm Products	Foods	Hides and Leather Products	Textile Products	Fuel and Lighting	Metals and Metal Products	Building Materials	Chemicals and Allied Products	House Furnishing Goods	Miscellaneous	ALL COMMODITIES
August	162.3	160.6	179.0	137.9	129.7	168.7	188.2	119.7	143.0	109.8	153.0
September	163.1	162.0	181.1	139.0	130.6	168.4	189.4	117.7	142.9	109.6	153.7
October	159.6	159.6	181.3	138.1	130.6	167.3	189.2	116.0	143.0	109.0	152.2

INDEX OF DEPARTMENT STORE SALES

Index numbers, 1935-39 daily average=100 with seasonal adjustment. Compiled by Federal Reserve Bank.

	Total 12th Fed. Res. Dist.		Southern California		Northern California		Portland		Western Washington		Eastern Washington and northern Idaho		Utah and southern Idaho		Phoenix	
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
August	361	335	416	373	312	296	367	322	321	349	374	360	342	308	469	407
September	349	325	397	358	317	293	344	311	290	330	374	356	332	308	464	410
October	344	337	386	367	308	308	347	307	302	345	372	356	337	345	464	446

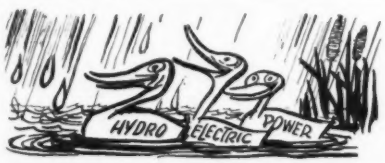
(Continued from page 13)

that many of the economic obstacles are being studied by everyone and bit by bit the answers are found — someone learns how another firm or entire industry has gotten around an unfavorable freight handicap, someone else discovers where a good market exists, and others find latent demands for products they are equipped to manufacture. Perhaps the most obvious fact is that the sales tempo in the West must be accelerated, and that many a firm which feels it knows all the answers to selling is really still in the kindergarten stage.

Electric Energy

Supply prospects in the Pacific Northwest look much better, as a result of good rains in November that have brought stream flow up considerably from the low point at the end of October. As a result, it appears now that the area will get through the winter without curtailment of consumption except for the interruptible contracts, of which the aluminum companies are the most important, and even they may be able to pick up some more load before the winter is out. Loads in the Northwest are still falling below early estimates, but the first 10 months of 1949 were 5 per cent above 1948. Northern California loads for the same period were 13 per cent above 1948. Lack of fall rains in California have reduced stream flow, but the season is still too early for this to mean anything, and even if it should turn out to be a dry winter, the large amount of new steam plants should take care of all needs.

Pacific Gas & Electric brought in the first unit of their Cresta hydro plant in November, adding 35,000 kilowatts to their supply. The first unit will handle all the water available at Cresta until late spring, by which time it is expected the second unit will be complete.



ELECTRIC ENERGY

(Production for Public Use—In thousands of kilowatt hours. Source: Federal Power Commission)

	Mountain		Pacific Northwest		California		Total Pacific	
	1948	1949	1948	1949	1948	1949	1948	1949
May	1,248,630	1,218,907	1,555,721	1,658,316	1,559,727	1,857,778	3,115,448	3,516,094
June	1,453,761	1,470,751	1,455,985	1,704,943	1,746,341	2,082,002	3,202,326	3,786,945
July	1,564,700	1,445,233	1,662,191	1,681,142	1,946,774	2,176,358	3,608,965	3,857,500
August	1,502,169	1,561,811	1,723,442	1,812,839	2,060,942	2,198,169	3,784,384	4,011,008
September	1,471,029	1,533,084	1,698,535	1,789,376	1,859,568	1,929,100	3,558,123	3,718,476
October	1,142,483	1,336,503	1,709,327	1,727,287	1,762,394	1,786,962	3,471,721	3,514,249

*Revised.

Oil

West Coast oil production is now in better balance with demand than for some time, largely because of sizeable shipments of residual fuel oils to the East. This relief from local oversupply, however, promises to be temporary. Oil Producers Agency points out that West Coast inventories of residual fuels have jumped from about 12,000,000 barrels in 1947 to 38,000,000 in 1949, whereas the intercoastal shipments so far announced will drain away only about 5,000,000 barrels. Pressure to curtail some of California's low-gravity oil-producing wells should continue heavy for some time.

The intercoastal shipments, at substantially reduced prices from those prevailing a short time ago, may stimulate new markets for Western fuel oils. Inquiries are reported from midwest distributors who seem to be considering bringing California heavy oil through the Panama Canal and up the Mississippi to industries located on inland waterways.

Meanwhile imports of residual oils to the East Coast jumped this fall from 173,000 to 236,000 barrels daily, accounting for most of the recent rise in flow of foreign oil to this country. Exports continue downgrade. Proposals now reported in Washington would have the British buy some $200,000,000 worth of equipment for its oil producing and refining industry, paying for it in "sterling oil."

Effects of constant coal strikes on competing fuels are shown by figures just released, indicating that in 1948, 8 per cent of the power

(Continued on page 17)

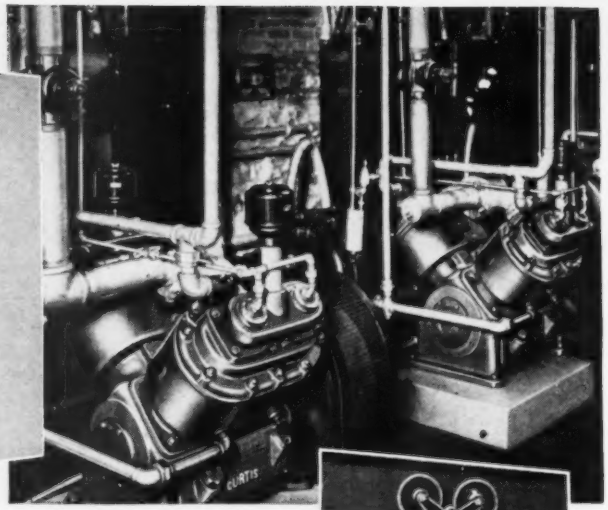
PETROLEUM

(California, Oregon, Washington, Arizona, Nevada)
(From Bureau of Mines)

	CRUDE PRODUCTION (Barrels, daily avg.)	TOTAL DELIVERIES (Thousands of barrels daily) GASOLINE		GAS OIL & DIESEL		HEAVY FUEL OIL		ALL PRODUCTS	
	1949	1948	1949	1948	1949	1948	1949	1948	1949
May	927,000	362	372	141	126	386	384	1,021	1,001
June	921,000	350	380	125	132	379	339	1,023	994
July	907,000	350	374	130	131	368	311	1,020	979
August	896,000	373	374	126	109	376	317	1,023	969
September	898,000	220	375	103	137	239	318	819	972
October	877,000	315	370	123	132	337	309	1,005	950

Reduce Production Costs with CURTIS

AIR COMPRESSORS, AIR HOISTS AND AIR CYLINDERS



Plant after plant is turning to Curtis Air Hoists and Cylinders for pushing, pulling, lowering or lifting operations . . . and to multiple installations of Curtis Air Compressors, which eliminate long air lines, the possibility of air leaks, and losses resulting from breakdowns of central air compressor installations.

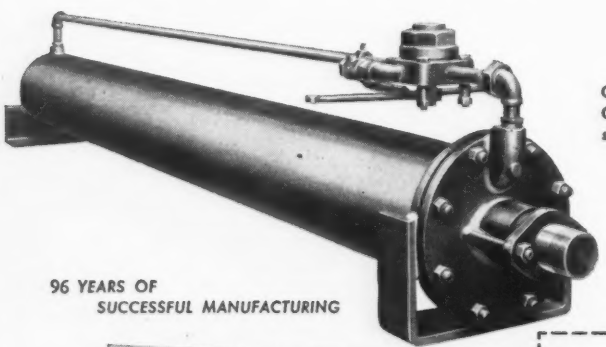
Here's why it will pay you to consider CURTIS *equipment*

AIR HOISTS AND AIR CYLINDERS

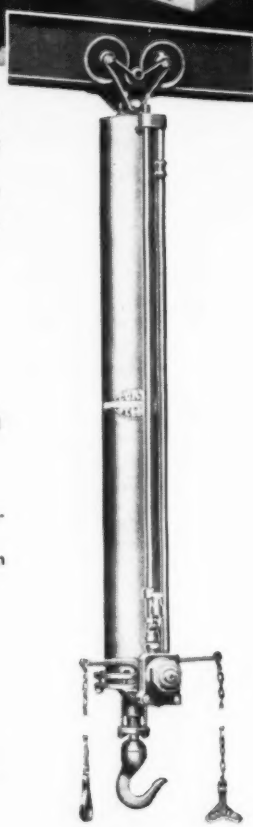
- Cannot be overloaded.
- Hoisting or lowering speed is controlled by operator.
- Ground-steel cylinder.
- Disc type valves.
- Valve automatically returns to vertical position when released.
- Can be operated by unskilled labor.

AIR COMPRESSORS

- Timken-Bearing equipped—permits external adjustment.
- Self oiling—positive lubrication.
- Precision construction throughout.
- Complete valve assembly removed or replaced in a few moments.
- Cylinder, crankcase, also heads made from gas-tight iron.
- Fully enclosed.



Curtis bracketed-type Air-Hoist Cylinder can be placed in any position from horizontal to vertical.



Curtis Pendant Air Hoist can be used for practically any lifting problem where the head room is not limited.

96 YEARS OF SUCCESSFUL MANUFACTURING

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I am interested only in items checked below:

- ☐ Air Hoists
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- ☐ Air Compressors

NAME_____

FIRM_____

STREET_____

CITY_____ ZONE____ STATE_____

(Continued from page 15)

generated by New England steam plants came from coal. Last July, only 40 per cent of this power was being generated from coal, the balance from oil which was being delivered at Boston Harbor at $1.65 per barrel.

New information of immense value to the oil industry may be developed in the U. S. Geological Survey's most ambitious study, now under way. Western areas will be surveyed for data which will indicate areas favorable to oil and gas formation and also delimit those where such deposits are exceedingly improbable. U.S.G.S. will map in detail the Colorado and Chattanooga oil shale deposits, as well as Texas, California, and Utah areas whose bituminous rocks show a potential reserve of more than two billion barrels of heavy oil, and will make areas of the continental shelf off Los Angeles.

NATURAL GAS
(CALIFORNIA)

(Compiled by Roy M. Bauer, gas supply supervisor, Southern California Gas Company)

1949	Domestic and Commercial — Number of	Industrial Consumers —	Utilization (in thousands of cubic feet) Domestic and Comm'l Sales	Industrial Sales	Electric Generation	Net Receipts from Producers
July	2,597,220	5,818	11,212,883	11,793,076	6,957,902	33,856,621
August	2,606,078	5,837	10,366,683	12,614,727	9,754,518	37,686,932
September	2,619,736	5,920	10,704,415	13,563,453	8,539,396	35,796,261

Steel

Coast steel mills are optimistic over sales possibilities this year, with the multitude of demands resulting from residential construction. Building and furnishing items, such as plumbers' pipe, barrels, drums, garbage containers, cabinets, stall showers, hot water heaters, floor furnaces and other space heating equipment, and stoves, plus pipes for the big transcontinental gas lines, constitute the backbone of demand in the West. Automobile parts continue to increase in volume, with radiators now being made out here, manufacturers toying with the possibility of making gas tanks, and replacement items building up, such as fenders and hub caps. The likelihood of steel coming in from Belgium and Luxemburg, as a result of their currency devaluation and decision to sell export at the same price as domestic, looms on the horizon.

While most steel users were able to get by in the West during the strike period, Nash Motors, who had been predicting they would be unable to keep their assembly plant at El Segundo, Calif., in operation, notified their employees at the first of December that they would shut down from December 9 to January, on account of the inability of their suppliers to obtain steel.

Shipments and sale of metal cans are reported by the Department of Commerce for the Mountain, Pacific and Hawaii areas combined, in terms of short tons of steel consumed in manufacture of the cans:

TOTAL SHIPMENTS

	Total	Food	Nonfood
Second quarter,1949, Mountain	403,187	374,399	28,788
Third quarter, 1949	403,187	374,399	28,788
Second quarter, 1949, Mountain	5,301	.....	.....
Pacific and Hawaii	121,252	99,450	21,802
Third quarter, 1948	343,012	321,370	21,642

The above figures include the following tonnages of steel for food cans for own use, instead of sale: Third quarter 1949: 14,523; second quarter 1949: 11,986; third quarter 1948: 13,138.

IRON AND STEEL
Western Area of the United States
From American Iron and Steel Institute (in net tons)

	Pigiron Output	Percent of Capacity	Steel Output	Percent of Capacity
May	194,525	78.6	405,170	90.6
June	170,546	71.2	351,917	81.3
July	170,475	69.1	338,861	76.0
August	178,866	72.3	372,812	83.4
September	162,007	67.8	328,618	76.1
October	52,535	21.2	115,527	25.8

ALLOY STEEL
(In thousands of bbls.; from U. S. Bureau of Mines)

	Output	Carbon Ingots, Not Topped*
May	4,423	9,690
June	4,990	7,051
July	4,452	6,828
August	4,177	7,182
September	4,097	5,879

*Included in total steel.

Coal

Bituminous coal production in the intermountain area was normal in November, except for a few captive mines which were closed because of the steel strike. The industry was generally operating on a five-day week basis.

BITUMINOUS COAL AND LIGNITE
(In thousands of tons—From Bureau of Mines)

	Colo.-N. Mex. 1948	Colo.-N. Mex. 1949	Wyoming 1948	Wyoming 1949	Utah 1948	Utah 1949
July	351	195	348	336	508	265
August	539	404	483	459	542	527
September	600	271	512	205	547	244
			Montana		Wash.-Alaska	
			1948	1949	1948	1949
July			220	166	95	74
August			223	280	120	96
September			237	198	138	71

Metals

Non-ferrous metal production held steady through November or turned slightly upward. A few of the mines which closed earlier in the year because of falling prices have reopened but others are still down, presumably waiting for congressional action on the O'Mahoney bill in January.

NONFERROUS METALS
SEPTEMBER

(Production in short tons. From U. S. Bureau of Mines)

	ARIZONA	UTAH	MONTANA	NEW MEXICO	NEVADA	WEST'N STATES
Copper	26,065	17,220	3,755	3,824	3,080	54,733
Lead	2,700	680	2,392	3,140	1,300	1,120
Zinc	5,600	2,850	3,585	870	1,560	23,167

Aluminum

Aluminum business continues good, and the lateness of the fall season permitted building operations to go on much later than usual, with the result that aluminum sales in this field apparently have measured up to 1948. Appliances and utensils have had a good fall season, but not up to the record-breaking year of 1948. One of the new factors, perhaps only a temporary one, was the demand for aluminum grain bins to store the 1949 crop.

Aircraft

With the Navy already decommissioning 35 squadrons or about 480 planes, under the new economy program, the aircraft industry is watching without too much optimism the outcome of Federal budgeting.

Unless Defense Secretary Johnson's committee changes its mind, the amount to be spent in 1950 will remain at a billion and a quarter instead of more than two billion dollars. Industry dopesters hold some hopes the committee may relent and disburse some of the $180,000,000 it struck from the budget, but aren't very optimistic that President Truman will release the $615,000,000 he froze to hold the program at 48 instead of 58 groups.

Congressional attention soon will study American Industry's position in development of jet transport planes, in view of the rapid strides being made in England. Senator Brewster, who headed the Air Policy Board, is concerned lest U.S. makers fall behind. He wants Government support extended as a measure of military preparedness. Yet aircraft makers are reluctant to take on heavy development costs, especially because jet transports eat too much fuel to be attractive to commercial air freight operators.

New creations just announced by the industry include:

By Ryan at San Diego, the Air force first air to air missile, the "Firebird," termed "virtually a fragmentation shell with human intelligence." This ten foot projectile is launched from a "mother" jet fighter plane against enemy craft, adding to its parent's speed the extra power of its own booster rocket, plus additional flight rock-

(Continued on page 19)

AIR FREIGHT
(In pounds. Figures from airports.)

	Los Angeles* In	Los Angeles* Out	San Francisco In	San Francisco Out	Oakland In	Oakland Out	Portland In	Portland Out	Seattle In	Seattle Out
August	1,292,300	1,260,319	1,608,977	937,110	111,884	241,723	....	....	437,172	889,494
September	1,435,127	1,343,327	958,438	1,383,804	97,912	249,726	....	....	446,615	932,605
October	1,466,002	1,526,568	1,137,901	1,269,481	116,344	171,614	....	....	463,149	885,980

Steel Problems?

Call Jorgensen First

THIS is little talk about *yield point.* Everything has its yield point. If for instance you are building a gasoline tank truck of plain carbon steel, you must build a lot of deadweight into it if you want it to have a yield point sufficiently high to take care of *all* conditions under which it *may* be operated. Or you can make it a lightweight, profitable piece of equipment by building it of low-alloy, high-tensile steel, with a *high* yield point . . . almost *double* that of ordinary carbon steel. Moreover, when the pressure is on, you can sit back and relax because you will *know* your equipment can take it! Remember that Jorgensen carries complete stocks of both ordinary and special purpose steels—so *CALL JORGENSEN FIRST!*

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(Continued from page 17)

ets. It is exploded by electronic and radar control against its target, or else automatically detonates harmlessly in mid air if it misses.

Also by Ryan for civilian flight, a new 260 h.p. Navion designed to sell for less than $14,000 completely equipped and intended especially for ranchers, mining and lumber companies, and others needing a plane capable of fast climbing from short landing fields at high altitudes.

By Boeing at Seattle, a new electro mechanical "brain" which simulates the flight of guided missiles electrically, plotting the flight course from imaginary take-off to imaginary landing.

By Consolidated Vultee at Forth Worth, a new 6-engine transport to be called the C-99, capable of carrying 100,000 pounds or 400 armed men from the East Coast to western Europe and built 70 per cent from parts identical with the B-36's.

By Douglas at Santa Monica, a 360-m.p.h. passenger airliner to be known as the DC-6B, bigger and faster than the standard DC-6 and intended as companion to the DC-6A Liftmaster cargo plane.

Also by Douglas, the Navy's swept-wing Skyrocket, second plane in a research program of which the first was the jet-powered, straight wing Skystreak that set two world's records in the neighborhood of 650 m.p.h. The Skyrocket, just tested at supersonic speeds, is designed for 1820 m.p.h. at 75,000 feet.

Lumber

Many lumber wholesalers were ready during November to drop their prices small amounts on short notice — but that expected weakness didn't develop beyond the undertone stage and the market entered December with lumber in mostly strong hands at the mill level, industry spokesmen report.

At the start of the Christmas holiday season it was generally indicated that bad weather would be the only major reason for a drop in the market before the spring pickup in rail business began to be felt. The attitude toward spring business was bullish, although there was a small drop in some futures at the end of November.

There was agreement on the forecast of the national lumber survey committee in its report to the department of commerce. The committee expected shipments and production for the fourth quarter to be substantially ahead of the same quarter of 1948. This appeared to be a fairly safe guess in view of the big order file maintained during the first two months of the quarter.

Western pine was in the unique position of maintaining orders ahead of production through the entire fall season until mid-November, a period when the mills normally should be putting a generous portion of their lumber into inventory for drying. After mid-November pine orders dropped slightly under production.

In the fir region west of the Cascades, orders also continued bullishly ahead of production until mid-November. Then the demand dropped below output, bringing talk of weakness into the foreground. Then, in the pre-Thanksgiving week, orders pushed ahead of production to indicate a still-firm foundation under the market.

In fir, however, there has been an artificial side to the market created by the car shortage. This price stimulant was disappearing fast at the end of November as mills again were beginning to get cars and there was talk of second-shift operations in some quarters. This meant an end to premiums for quick car numbers, but basically the market was unchanged—with that expected spring buying rush not too far around the corner.

Canadian mills were quoting prices a little under U. S. prices in November but British Columbia mills were expected to get the lion's share of the UK 100 million foot order for January-March delivery.

LUMBER

(In thousands of board feet)

From West Coast Lumbermen's Association (Douglas Fir, Sitka Spruce, Port Orford Cedar, West Coast Hemlock, Western Red Cedar):

Year through October	1947	1948	1949
Production	7,183,788	7,303,589	6,772,751

From Western Pine Association figures (Idaho White Pine, Ponderosa, Sugar Pine and associated species):

Year through October	1948	1949
Production	2,530,825	2,310,499

From California Redwood Ass'n figures (includes redwoods and whitewoods):

Year through October	
Production	390,938

Plywood

Currently the market is strong and prices are firm. Mills are operating at optimum capacity, which is to say at a good healthy rate of production, without the stress of round the clock shifts such as prevailed during the war years. The market looks good through 1950, with the possible development of some let down about next summer for two or three months due to current over-buying. Outlook is that 1950 production will run about the same as 1949. Log supply is fairly good with some easing in prices and, barring a bad and continuing freeze-up, raw material will keep pace with production demands.

SOFT PLYWOOD

From Bureau of the Census

PRODUCTION

(In thousands of square feet)

	1948	1949
July	123,517	96,538
August	173,009	169,472
September	178,963	168,747

Pulp

Mills are all running full again in Oregon, Washington and British Columbia. The order situation has improved considerably in the past 30 days; this is particularly true with the plants manufacturing dissolving pulps from which rayon, etc. is made.

The general market situation has stiffened and is now fairly firm. Log supply of pulp species is more plentiful than lumber species and with a normal winter—that is, no long drawn out freeze-up as last year—wood supply will be adequate.

Recently labor negotiations passed smoothly,. with no hourly increases, although some minor concessions were granted. Labor efficiency is steadily improving and the region boasts the highest paid and most efficient labor force of the world in its industry.

PULPWOOD

(Pacific Northwest)

(Cords of 128 cu. ft., roughwood basis. Source: Bureau of Census)

	Receipts	Consumption
July	273,469	189,542
August	362,568	264,890
September	270,386*	251,927*

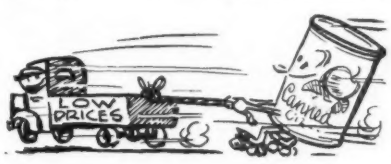
* Preliminary figures.

Canning and Packing

California canned fruits have had a good fall selling season, the November 1 statistical reports of the Canners League of California show, apparently as the result of lower prices which had made canned fruit a more attractive buy for the trade and for ultimate consumers. The total supply to be moved, of carryover from last year plus 1949 pack, was about 5 per cent greater than in 1948, and about 60 per cent of the total supply is reported as sold, although purchasers often fail to order the goods shipped. Prospects that shipments will be made seem, however, to be much better than last year.

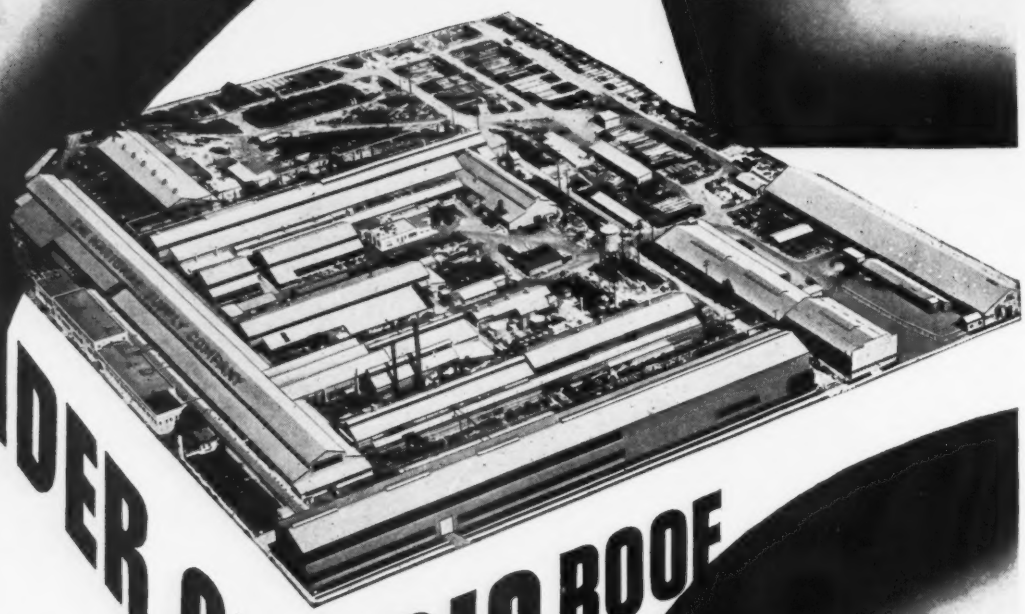
The November 1 figures are as follows on a No. 2½ can basis:

CANNED APRICOTS	1948-49	1949-50
Total supply	5,290,131	3,815,745
Nov. 1 stocks (sold and unsold)	3,283,857	1,941,471
Movement—June 1 to Nov. 1	2,006,274	1,874,274
SWEET CHERRIES		
Total supply	238,699	701,669
Nov. 1 stocks (sold and unsold)	52,255	316,210
Movement—June 1 to Nov. 1	186,444	385,459
CLING PEACHES		
Total supply	15,896,915	19,607,194
Nov. 1 stocks (sold and unsold)	9,658,582	11,867,104
Movement—June 1 to Nov. 1	6,238,333	7,740,090
FREE PEACHES		
Total supply	1,955,640	1,764,386
Nov. 1 stocks (sold and unsold)	1,056,602	1,109,950
Movement—June 1 to Nov. 1	899,038	654,436
FRUIT COCKTAIL		
Total supply	10,053,831	9,118,122
Nov. 1 stocks (sold and unsold)	6,987,434	6,082,075
Movement—June 1 to Nov. 1	3,066,397	3,066,047
FRUITS FOR SALAD		
Total supply	919,769	902,988
Nov. 1 stocks (sold and unsold)	580,169	746,077
Movement—June 1 to Nov. 1	339,600	156,911
MIXED FRUITS		
Total supply	214,652	484,950
Nov. 1 stocks (sold and unsold)	106,411	438,071
Movement—June 1 to Nov. 1	108,241	46,879



Northwest Canners Association reports freestone peach pack for Oregon and Washington as 736,800 cases, as against 655,876 cases in 1948. Purple plum pack was nearly double 1948, totaling 1,669,260 cases, compared with 856,053 cases. Canned blackberries 190,983 cases, slightly under the 202,782 cases in previous year.

Tuna boats in southern California have been tied up for several months because canneries overstocked, but in December began going out to sea again. Prices paid to fishermen are $310 a ton for yellowfin and $290 for skipjack.



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Flour

The holiday season found flour volume considerably below a year ago, with the baking trade generally in the same bearish frame of mind they have held for some six months. Nevertheless, some bakers have booked flour on a 60 to 90-day basis, while their brothers are still on the day-to-day basis. Their lack of confidence is in spite of the fact that the present wheat crop has a support price of 90 per cent of parity. Mills are running considerably below capacity. There is hope in some quarters of an increase in flour exports next year. Feed prices continue strong.

WHEAT FLOUR

(In thousands of sacks. From Bureau of the Census)

	Ore.-Wash.	Montana	Utah	Colorado	California	Total
April	971	264	259	363	261	2,118
May	1,159	278	281	307	313	2,338
June	1,210	268	305	346	415	2,544
July	1,217	237	329	337	396	2,516
August	1,362	264	352	401	412	2,791
September	1,219	256	311	319	398	2,503

Sugar

Because of increased storage and handling costs necessitated by the six months waterfront strike, Hawaiian sugar planters will get nearer $105 a ton for their 1949 raw sugar than $115, according to the annual report of the Hawaiian Sugar Planters Association. The report indicated that 200,000 tons of the crop would remain unshipped at the end of December, 1949, and that the manufacturing subsidiary of the plantations, California & Hawaiian Sugar Refining Company, which had the added burden of a three-months strike tie-up of refinery workers, would only refine 475,000 tons instead of an anticipated 875,000 tons. C & H resumed operations Nov. 23, and the big refinery at Crockett has been running full tilt ever since.

California's beet sugar crop turned out very well, with yields per acre much better than expected, and prospects for a big crop in the Imperial Valley next spring are reported excellent.

Liquid sugar has become more competitive with bulk sugar delivered in tote bins or tank truckloads, as the result of a price change in November which increased the differential between granulated and liquid in terms of sucrose equivalent from 7c to 15c. The bulk sugar differential is 20c.

Building Materials

Construction costs as reported by the American Appraisal Company for October show a minute decrease from the previous month, but a substantial drop from a year ago, indicative of a slowly declining cost curve. Their figures do not include plumbing, heating, lighting, sprinkler system, etc. The index, which is based on 100 for 1913, reflects the cost trend in each city, but not the relative trend between cities. The figures are:

	All-Time High Oct. 1948	Sept. 1949	Oct. 1949
Denver	458	439	438
Seattle	523	506	504
San Francisco	460	443	442
Los Angeles	488	474	472

STRUCTURAL CLAY PRODUCTS

	UNGLAZED BRICK (in thousands of standard brick)		UNGLAZED STRUCTURAL TILE (short tons)		VITRIFIED CLAY SEWER PIPE (short tons)	
	Mountain	Pacific	Mountain	Pacific	Mountain	Pacific
April	8,276	16,237	2,519	2,203	2,785	15,765
May	11,997	20,864	2,894	2,691	2,534	15,751
June	13,314	28,182	1,887	2,644	2,657	16,679
July	6,351	26,055	1,994	3,095	2,378	15,738
August	8,515	29,762	2,624	3,200	2,842	16,103
September	7,927	29,001	2,082	2,975	2,749	15,473

Furniture

Chrome furniture manufacturers in southern California have been enjoying extremely productive runs in recent months. Case goods manufacturers are giving anywhere from immediate to 60 days delivery from receipt of order, and the larger upholstery makers are giving about 10 days.

CONFECTIONERY AND COMPETITIVE CHOCOLATE PRODUCTS

(From Bureau of Census)
(In thousands of dollars)

Month	COLO. - IDAHO - UTAH Sales	Per Cent Change from same month of Preceding Year	— WASH. - OREGON — Sales	Per Cent Change of Preceding Year from same month	— CALIFORNIA — Sales	Per Cent Change of Preceding Year from same month
April	499	+ 3	341	+ 8	1,934	—14
May	387	+ 6	227	— 3	1,663	— 5
June	381	+ 2	217	...	1,731	— 1
July	272	—13	265	+67	1,245	—15
August	336	— 6	241	*	1,849	— 6
September	593	*	573	+ 9	2,009	— 8

* Change of less than 0.5 per cent.

Cement

Many people have felt bad about lack of rain in the fall months, but not the cement people. They were able to keep going until well into December because of the fine weather, because building construction and paving kept on far beyond the usual closing-down period for the winter months. Mills are very low in inventories, but from now on will be able to build up during the slack season.

CEMENT

(In thousands of bbls.; from U. S. Bureau of Mines)

	—California— 1948	1949	Oregon - Wash. 1948	1949	Colo.-Wyom. Mont. Utah - Idaho 1948	1949
May	2,019	2,042	559	652	415	488
June	2,022	2,066	586	636	394	529
July	2,077	2,011	638	657	487	653
August	2,133	2,081	639	594	540	570
Sept.	2,116	1,982	607	566	511	418
Oct.	2,320	1,936	639	563	591	656

ETHYL ALCOHOL

(From Bureau of Internal Revenue)
Production (in proof gallons)

DOMESTIC UNDENATURED ALCOHOL

1949	California	Colorado	Washington
May	379,931	.....	269,087
June	668,503	.....	244,170
July	451,006	.....	.....
August	416,574	.....	174,602
September	527,974	.....	214,617
October	290,758	.....	194,576

DENATURED ALCOHOL

1949	California Completely Denatured	Specially Denatured— California	Utah	Washington
May	15,420	267,394	....	8,168
June	30,608	292,489	....	16,301
July	4,566	171,858	....	8,142
August	21,669	260,509	....	16,286
September	2,418	211,084	....	16,242
October	19,379	231,696	....	.....

CALIFORNIA COTTONSEED

(In tons of 2,000 lbs.)

	Receipts at Mills	Crushed or Used
March	6,994	41,759
April	.....	30,558
May	1,497	28,328

CALIFORNIA COTTONSEED PRODUCTS

	Crude Oil (1,000 lbs.)	Cake & Meal (tons)	Hulls (tons)	Linters (Running bales)
February	11,917	17,044	6,817	12,254
March	14,182	19,532	9,219	14,053
April	10,521	14,860	4,398	10,856
May	9,361	13,868	5,936	8,638

Apparel

Competition from the automobile for the consumer's dollar is blamed by some industry men for 1949's drop in wearing apparel sales.

In major West Coast cities, retail clothing trade was off 10 to 15 per cent during the first nine months. A late pickup enabled manufacturers to close the year in better shape, however.

Employment has picked up somewhat, particularly in plants specializing in men's suits and sportswear for both men and women.

Efforts are being made to step up sales of British fabrics in this country, but even the devaluated pound has not served to whip up much added interest in the still high-priced imported woolens. Consumer resistance is too high now in the top price brackets.

Nation's Safest Shipyard Is in San Francisco

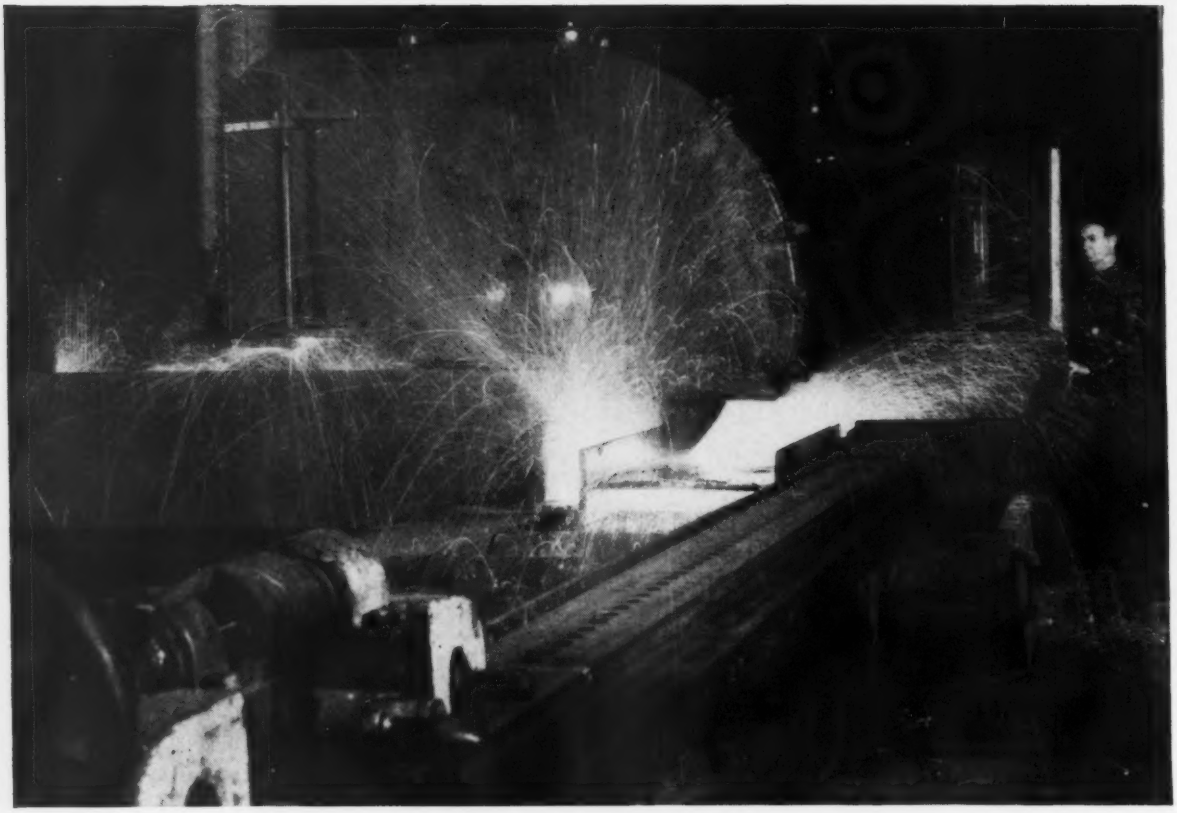
San Francisco's Naval Shipyard is acclaimed first in the nation for accident prevention during the past fiscal year.

This award is made on basis of competition among all Federal and private shipyards in the United States.

Accident cost, including medical leaves and compensation, to the San Francisco Naval Shipyard last year was 13 cents per hundred dollars of payroll. Recently the yard went 140 days without a loss-of-time accident, breaking its own national record of 96 days.

Evening Schools

The evening schools of accountancy, law, and traffic of Golden Gate College, San Francisco, will open the spring semester on Monday evening, January 9. The other evening schools of the college, management, insurance, advertising and a second section of accountancy are scheduled to open the week of January 30. The day school of accountancy and management opens February 13.



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THE INDUSTRIALIZED WEST

NUCLEAR ENERGY. . . *The West is the scene of the greater part of the development of this new and only dimly understood force in human experience. Here is a fast reactor panel at the Atomic Energy Commission operation at Los Alamos, New Mexico. Jane and David Hall, the young married couple pictured, both Ph.D.s, worked together on this problem and they are the two solely responsible for its invention.*

Review and Forecast:

Tide of Population Creates An Expanding Economy

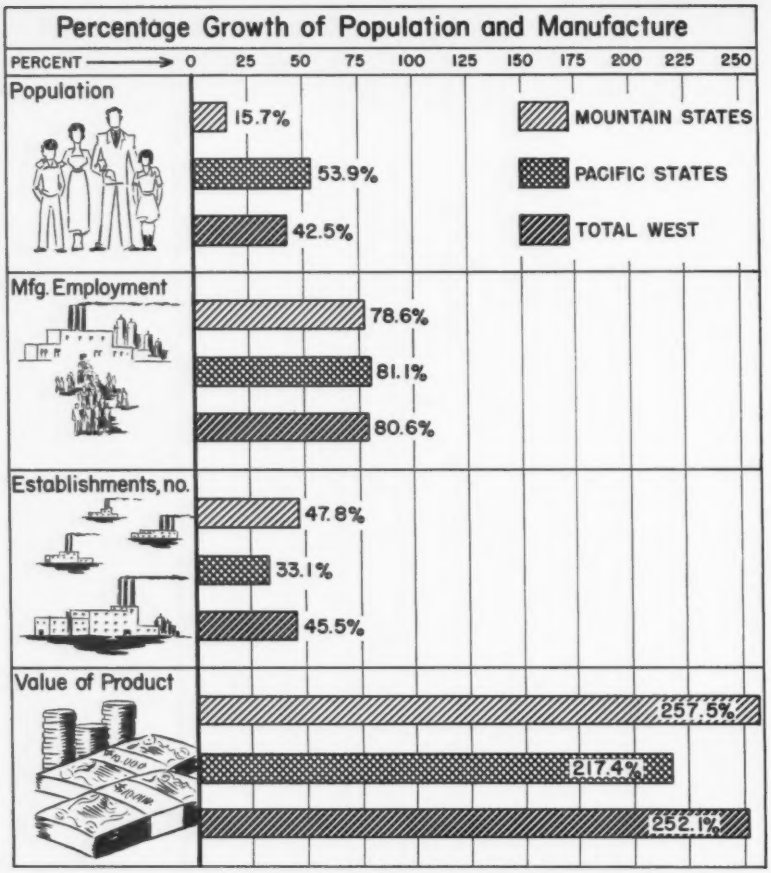
By A. C. PRENDERGAST
Editor, *Western Industry*

AN expanding economy expands. Its population, its employment and its industries all pretty much grow together.

The population curve running back for many years has shown an increasing Westward turning by people who come here, like it and cast in their lot with the West, regardless of the fact that in so many respects it is an undeveloped country. Therefore, it follows that employment and industry will keep pace, even if temporary pools of unemployment appear.

That seems to be a simple and accurate way to describe the future of the West for the next few decades. The West has had its twentieth century "gold rush" of the war period, and its first postwar surge of new population, new industries and enlarged old industries has perhaps passed its peak. But the Westward tide of population inexorably goes on, even if a surge always is followed by a slower movement.

Should the population movement for the next decade be slower than the last, it will still be highly important. One-fourth to one-third of the total national growth in population from now to 1960 can be expected in the Pacific Coast area, according to a solidly based estimate in an interim report by V. B. Stanbery, of the San Francisco office of the U. S. Department of Commerce, chairman of the economics technical committee of the Pacific Coast Board of Intergovernmental Relations, which is



THE WEST'S MANUFACTURING GROWTH — MOUNTAIN AREA FOLLOWS CLOSE BEHIND COAST

(Figures from 1947 U. S. Census of Manufactures)

	Number of Establishments		Number of Production Workers (thousands)		Value Added by Manufacture (in millions of dollars)	
	1939	1947	1939	1947	1939	1947
Washington	2,858	3,407	82.3	122.8	$267.7	$871.8
Oregon	1,903	3,075	57.5	92.0	156.7	673.0
California	11,558	17,645	271.3	529.8	1,122.5	3,996.2
TOTAL PACIFIC	16,319	24,127	411.0	744.6	1,547.0	5,541.0
Montana	552	745	8.8	16.9	38.8	108.2
Idaho	498	664	9.9	14.6	29.8	109.7
Wyoming	300	255	3.4	4.2	15.3	31.4
Colorado	1,219	1,603	23.4	44.3	90.3	290.3
New Mexico	262	432	3.2	6.3	8.6	55.3
Arizona	313	545	5.9	11.2	31.6	104.0
Utah	549	773	11.5	20.0	43.3	128.7
Nevada	94	125	1.0	2.0	11.5	27.6
TOTAL MTN.	3,787	5,142	67.0	119.5	269.4	855.3
TOTAL WEST	20,106	29,269	478.0	864.1	1,816.4	6,396.3
Percentage growth:						
Pacific States		*47.8%*		*81.1%*		*275.3%*
Mtn. States		*51.1*		*78.6*		*217.4*
Total West		*45.5*		*80.6*		*252.1*

carrying on a basic economic survey of the Pacific Coast area.

Today's industrial base will hardly be adequate for the West's population in 1960, most certainly not for 1970. Between now and these two future dates more industry will develop in the West. Some of it will be ahead of its time, some just soon enough to meet immediate needs, and some will be considerably overdue. Untoward conditions might slow everything up, but unforeseen favorable events could accelerate the growth.

To support our prediction of employment and industry keeping pace with population, let us cite the estimates of the Pacific Coast Board of Intergovernmental Relations for California and Oregon, as follows:

	1940-48	1948-60
OREGON		
Population growth	49%	30%
Employment increase	52%	35%
CALIFORNIA		
Population growth	44.3%	35.4%
Employment increase	54.1%	34%

In the case of Oregon, it is stated that the tendency is for employment opportunities to increase slightly more rapidly than the medium estimate of population increase. A more rapid expansion of job opportunities would tend to raise somewhat the 1960 population of the state. California's employment increase from 1948 to 1960 is a maximum estimate.

Unfortunately, comparative estimates for Washington are not yet available, as the "PACBIR" studies are still in process.

Mountain States Keep Up

But the Coast states do not have a monopoly on Western industrial growth. The mountain states, thought by many people to be more or less standing still, have in reality followed along closely. Figures for percentage growth from the U. S. Census of Manufactures for the period from 1939 to 1947 are:

	Pacific %	*Mtn.* %	*Total West* %
Number of production workers	81.1	78.6	80.6
Number of mfg. establishments	47.8	33.1	45.5
Value of product	257.5	217.4	252.1

Advance findings of the Pacific Coast Board of Intergovernmental Relations survey indicate that population growth has been accompanied by a highly significant change in age groups which will affect the character of the consuming market in the West.

New Younger Generation

It should be remembered regarding the above calculations that the 1948 base on which the prediction for the future is made is larger than the 1940 base on which the percentage growth for the period up to now is figured. Consequently population, employment, and plant expansion may even be higher in actual volume for the next decade.

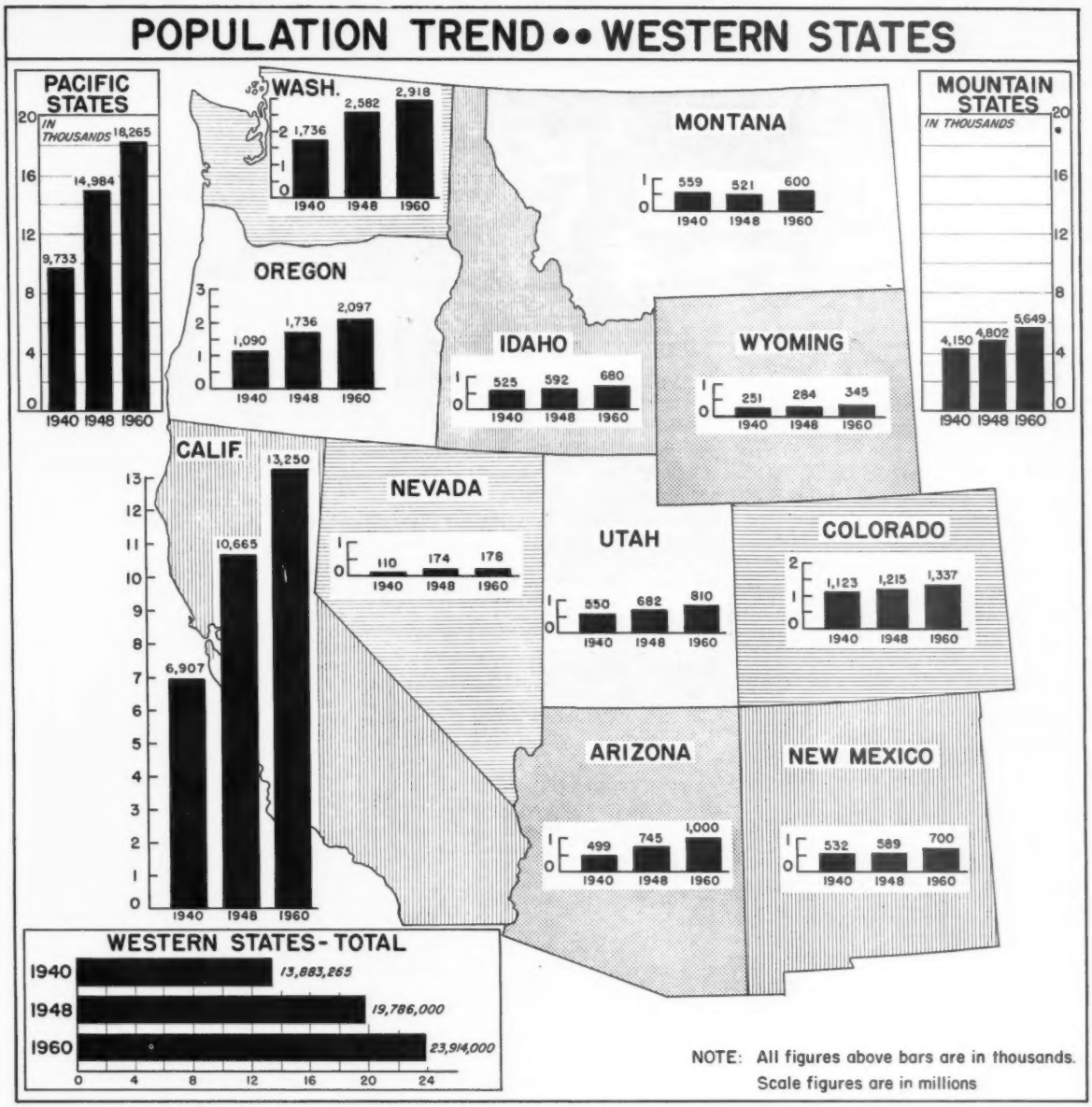
In the Pacific Coast area, which before the war had the smallest proportion of children of any large area in the nation, there has been a gain since 1940 of more than 1,750,000 children under age 15 (81 per cent increase), with a further indicated increase of from 570,000 to 1,223,000 in the next decade.

Resource Base Adequate

The next question involved in the development of the West is whether it has an adequate resource base, for projected population growth cannot materialize without the natural wherewithal to keep the economy going. To this the answer is "yes."

First of all comes water, with three big watersheds west of the Rocky Mountains involved. These are the Colorado

(Continued on page 26)



FUTURE WESTERN POPULATION TREND

	1940	*1948*	*1960*
Total West	13,883,265	19,786,000	23,914,000
Total Mountain	4,150,003	4,802,000	5,649,000
Montana	559,456	521,000	600,000
Idaho	524,873	592,000	680,000
Wyoming	250,742	284,000	345,000
Colorado	1,123,296	1,215,000	1,336,000
New Mexico	531,818	589,000	700,000
Arizona	499,261	745,000	1,000,000
Utah	550,310	682,000	810,000
Nevada	110,247	174,000	177,500
Total Pacific	9,733,262	14,984,000	18,265,000
Washington	1,736,191	2,582,000	2,918,000
Oregon	1,089,684	1,736,000	2,097,000
California	6,907,387	10,665,000	13,250,000

The figures on population for 1940 and 1948 are from U.S. Census Bureau. For 1960 forecast the sources are as follows: Coast states, Pacific Coast Board of Intergovernmental Relations; Montana, Montana Chamber of Commerce; Idaho, State Chamber of Commerce; Wyoming, Commerce and Industry Commission; Colorado, Colorado Resources Development Council; New Mexico, University of New Mexico; Arizona, Valley National Bank, Phoenix; Utah, Salt Lake City Chamber of Commerce; Nevada, Employment Security Department.

WESTERN METROPOLITAN AREAS RANK HIGH IN MANUFACTURING IMPORTANCE

(Figures from 1947 U. S. Census of Manufactures)

Number of Establishments		Production and Related Workers (thousands)		Value Added by Manufacture (millions)	
1. New York-Northeast New Jersey	48,287	1. New York-Northeast New Jersey	1,266.6	1. New York-Northeast New Jersey	$9,319.7
2. Chicago	12,278	2. Chicago	753.1	2. Chicago	5,524.9
3 *Los Angeles*	9,756	3. Detroit	466.8	3. Detroit	2,910.0
4. Philadelphia	7,395	4. Philadelphia	437.2	4. Philadelphia	2,803
5. Boston	5,407	5. Pittsburgh	284.1	5. *Los Angeles*	2,055.3
6. Detroit	4,755	6. *Los Angeles*	281.3	6. Pittsburgh	1,711.3
7. *San Francisco-Oakland*	3,668	7. Cleveland	218.9	7. Cleveland	1,546.1
8. Cleveland	3,259	8. Boston	215.3	8. Boston	1,391.2
9. St. Louis	2,958	9. St. Louis	200.0	9. St. Louis	1,292.3
10. Providence	2,358	10. Buffalo	149.8	10. *San Francisco-Oakland*	1,048.5

in the intermountain and Pacific Southwest areas, the Sacramento and San Joaquin in central California, and the Columbia in the Pacific Northwest. Over division of the lower Colorado River water a bitter controversy still rages between California and Arizona, but the other two present no difficulties regarding amount of supply.

In the Colorado River watershed, the upper basin states have voted out a satisfactory division of their share, as follows: 7,500,000 acre feet under the Colorado River Compact, Colorado, 51.75 per cent; Utah, 23 per cent; Wyoming, 14 per cent; New Mexico, 11.25 per cent; Arizona, which has a small area in the upper basin, the guaranteed use of 50,000 acre feet annually.

Political Problems Rage

In central California the big Central Valley Project is far enough along so that a small amount of the gigantic water diversion plan of surplus Sacramento River water to the less fortunate San Joaquin Valley is already in operation. Over the redistribution of water there is no quarrel, except that the attempt of the U.S. Reclamation Bureau to enforce application of the 160-acre land ownership limitation of the Reclamation Act to all acreage receiving water from the CVP project has provoked a storm of opposition. Much of this arises from the fact that the so-called family-size farm cannot compete too well in the large-scale production of California specialty crops. Another controversy rages over the attempted establishment of publicly-owned transmission and distribution systems for electric power from Shasta Dam on the headwaters of the Sacramento.

In the Pacific Northwest there is general agreement in the so-called "308 Plan" for development of a series of multi-purpose dams on the Columbia River and its tributaries at a cost to the government of $3 billion, which will put much new land under irrigation, control floods, lengthen out inland waterways, and develop hydro-electric power. But the Truman administration has proposed a Columbia Valley Authority patterned after TVA to control this development, and a bitter fight is raging against the establishment of a Washington-directed administrative body with virtual life-and-death power over the future of the area.

Too Much Oil

As for fuel and energy, it had been widely predicted up to a year ago that the Pacific Coast would become a deficit area for petroleum by 1951, and that fuel supply would be a big problem. But the picture suddenly changed, largely as a result of the dieselization of Western railroads, which had been heavy consumers of fuel oil. Now heavy oil is a drug on the market, and is even being exported to the Atlantic seaboard, and there is much more gasoline in storage than a year ago, despite increased consumption.

By 1960 Alberta and other Canadian areas are likely to be major producing areas, and the natural market after supplying Canadian needs, will be in the United States, moving east to the Great Lakes or west to Boise, Seattle, and Portland. Oil reserves of western Canada have grown in two years from a minor position to a figure one-sixth as high as California has ever had. In the Rocky Mountain area there is intense oil activity, and Standard Oil of California is building a pipeline from Salt Lake City to supply the Spokane area, which hitherto has obtained its oil by rail, or by barge line up the Columbia River supplemented by truck and rail.

Gas Situation Eases

Pilot plant work on shale oil in the western Colorado area has proceeded to the point that it may become commercially practical.

Sagging oil prices in California have relieved to some extent the pressure on the gas companies, because many industries have reverted to the use of oil, and the two pipelines being laid from western Texas to southern and northern California are expected to meet both residential, commercial and industrial demand for some years. Great hopes have been aroused in the Pacific Northwest for natural gas from Alberta, a "natural" as far as economics is concerned but extremely uncertain and explosive when it comes to the political questions involved.

Estimates for natural gas consumption in California indicate firm sales in the state will increase from 248 billion cubic feet in 1948 to 296 billion in 1952, while interruptible industrial sales amounting to 152 billion in 1948 are estimated at around 243 billion in 1952. Requirements of California utilities in 1952 may total around 640 billion cubic feet.

Power Demand Forecast

Rough estimates of the increase in electric utility demands by the Federal Power Commission are as follows, in thousands of kilowatts:

	1948	1960	1970
Arizona	353	550	670
Southern California	2,643	5,226	7,060
Northern California	2,138	4,112	5,150
Northwest (includ'g Utah & Montana)	4,297	8,432	11,900
Colorado	320*	666	897
Wyoming	67*	196	342

**Colorado figure is for 1947, Wyoming for 1946*

About two-thirds of the remaining undeveloped hydro power in the United States is in the West, according to Lesher S. Wing, regional engineer at San Francisco for the Federal Power Commission. This would be slightly above 55,207,000 horsepower.

Temporarily the Pacific Northwest is suffering from a shortage of hydro power needed to keep its electro-chemical industries in full operation. By 1952 new dams will be completed which will take care of the need.

Trend Toward Steam

As nearly all the cheap hydro possibilities in California have been taken up, utility companies are turning to steam for much of their future supply. In California, Arizona, and Nevada the steam percentage of total generation of electricity by utilities and industries has crept up from 10.7 per cent in 1940 to 38.1 per cent in 1948. In Oregon, Washington, Idaho, Utah, and Montana, it has decreased slightly, from 11 per cent in 1940 to 10.8 per cent in 1948.

Summing up potential supply, the West has 47 per cent of the coal reserves of the nation, 42 per cent of the installed hydro-electric capacity, 23 per cent of the proved crude oil reserves and 12 per cent of the natural gas. On a BTU basis, the eleven Western states derive 62 per cent of their energy from

crude oil and other oil well liquids, or 81 per cent if natural gas is included, 16 per cent from coal and 3 per cent from hydro-electric power. The other 37 states obtain 29 per cent of their energy from petroleum liquids, 13 per cent from natural gas, 54 per cent from coal and 4 per cent from hydro-electric power.

The Western steel industry is now producing 5.5 per cent of the national output, and shipments of iron ore from Utah, California and Wyoming in 1948 were over 4,000,000 tons, with iron content of some surpassing the Lake Superior average. Proven reserves of iron ore in Utah are estimated by the Bureau of Mines at 100,000,000 tons of more than 45 per cent iron, with an additional 250,000,000 gross tons inferred. The Eagle Mountain deposit on the Colorado Desert in southern California, from which the Kaiser supply is drawn is estimated at 21,600,000 tons of 51.2 per cent iron, and potential reserves of 40 per cent or more iron.

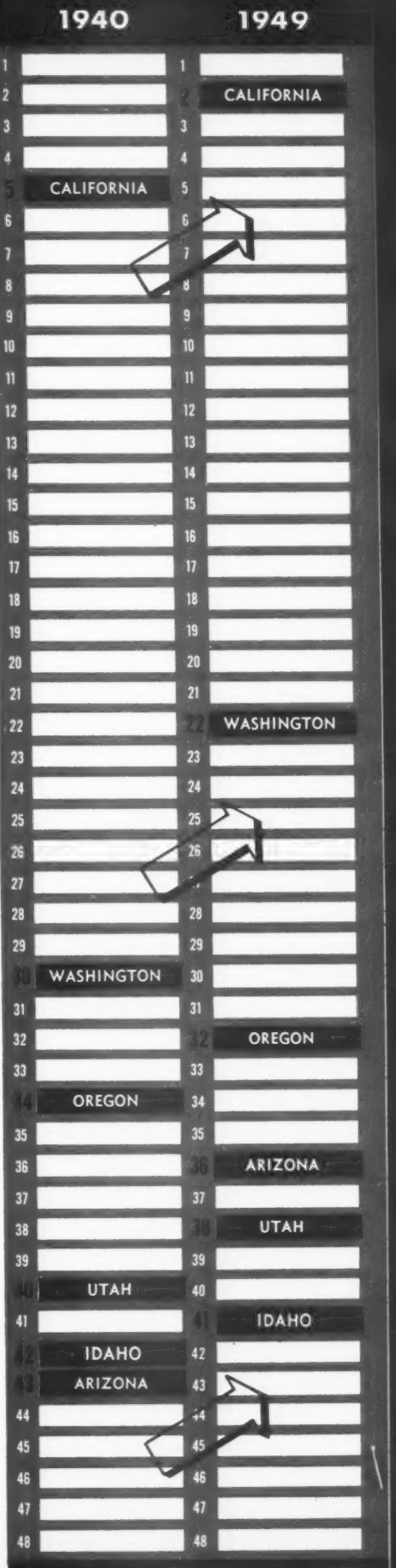
Another iron deposit in southern California came to light about six months ago, called "The Iron Age," in the Twenty-Nine Palms region on the Colorado Desert. Its owners report it as having 1,000,000 to 3,000,000 tons of the deposit above ground. It is declared to be suitable for cement mills and some steel mills, but not so desirable for open hearth.

Still another source of iron ore is the Pacific Northwest. According to Carl Zapffe, manager of the Northern Pacific Railway Company's iron ore properties, in an equal area "nowhere on earth is there so large a variety of iron

(Continued on page 28)

Western States Climb Nearer Top of Population Ladder

1940			1949			Increase or Decrease from 1940 to 1949	
Rank	State	Population	Rank	State	Population	Number	Per Cent
1.	New York	13,479,142	1.	New York	14,392,000	913,000	6.8
2.	Pennsylvania	9,900,180	2.	CALIFORNIA	10,665,000	3,758,000	54.4
3.	Illinois	7,897,241	3.	Pennsylvania	10,633,000	733,000	7.4
4.	Ohio	6,907,612	4.	Ohio	7,989,000	1,081,000	15.7
5.	CALIFORNIA	6,907,487	5.	Illinois	8,449,000	552,000	7.0
6.	Texas	6,414,824	6.	Texas	7,532,000	1,117,000	17.4
7.	Michigan	5,256,106	7.	Michigan	6,352,000	1,096,000	20.8
8.	Massachusetts	4,316,721	8.	New Jersey	4,873,000	397,000	9.2
9.	New Jersey	4,160,165	9.	Massachusetts	4,713,000	713,000	17.1
10.	Missouri	3,784,664	10.	Indiana	3,994,000	150,000	4.0
11.	North Carolina	3,571,623	11.	Missouri	3,935,000	293,000	8.2
12.	Indiana	3,427,796	12.	North Carolina	3,864,000	567,000	16.5
13.	Wisconsin	3,137,587	13.	Wisconsin	3,355,000	217,000	6.9
14.	Georgia	3,123,723	14.	Tennessee	3,234,000	318,000	10.9
15.	Tennessee	2,915,841	15.	Georgia	3,196,000	73,000	2.3
16.	Kentucky	2,845,627	16.	Virginia	3,102,000	425,000	15.9
17.	Alabama	2,832,961	17.	Minnesota	2,977,000	185,000	6.6
18.	Minnesota	2,792,300	18.	Alabama	2,920,000	87,000	3.1
19.	Virginia	2,677,773	19.	Kentucky	2,893,000	47,000	1.7
20.	Iowa	2,538,268	20.	Louisiana	2,630,000	105,000	4.1
21.	Louisiana	2,363,880	21.	Iowa	2,643,000	266,000	11.3
22.	Oklahoma	2,336,434	22.	WASHINGTON	2,582,000	846,000	48.7
23.	Mississippi	2,183,796	23.	Florida	2,494,000	597,000	31.4
24.	Arkansas	1,949,387	24.	Oklahoma	2,302,000	—35,000	—1.5
25.	West Virginia	1,901,974	25.	Maryland	2,175,000	354,000	19.4
26.	Florida	1,897,414	26.	Mississippi	2,130,000	—54,000	—2.5
27.	South Carolina	1,889,804	27.	Connecticut	2,019,000	310,000	18.1
28.	Maryland	1,821,244	28.	South Carolina	2,001,000	101,000	5.3
29.	Kansas	1,801,028	29.	Arkansas	1,964,000	14,000	0.7
30.	WASHINGTON	1,736,191	30.	Kansas	1,947,000	146,000	8.1
31.	Connecticut	1,709,242	31.	West Virginia	1,941,000	39,000	2.1
32.	Nebraska	1,315,834	32.	OREGON	1,736,000	647,00	59.3
33.	Colorado	1,123,296	33.	Nebraska	1,285,000	—31,000	—2.3
34.	OREGON	1,089,684	34.	Colorado	1,215,000	92,000	8.2
35.	Maine	847,226	35.	Maine	909,000	62,000	7.8
36.	Rhode Island	713,346	36.	ARIZONA	745,000	245,000	49.1
37.	South Dakota	642,961	37.	Rhode Island	743,000	29,000	4.1
38.	North Dakota	641,935	38.	UTAH	682,000	132,000	24.0
39.	Montana	559,456	39.	South Dakota	649,000	6,000	0.9
40.	UTAH	550,310	40.	North Dakota	641,000	—37,000	—5.7
41.	New Mexico	531,818	41.	IDAHO	592,000	67,000	12.8
42.	IDAHO	524,873	42.	New Mexico	589,000	57,000	10.8
43.	ARIZONA	499,261	43.	New Hampshire	544,000	53,000	10.7
44.	New Hampshire	491,524	44.	Montana	521,000	—39,000	—6.9
45.	Vermont	359,231	45.	Vermont	369,000	9,000	2.6
46.	Delaware	266,505	46.	Delaware	311,000	44,000	16.5
47.	Wyoming	250,742	47.	Wyoming	284,000	34,000	13.4
48.	Nevada	110,247	48.	Nevada	174,000	64,000	57.7



(Continued from page 27)

ores as occurs in the Pacific Northwest states, and for each variety there might be a special use."

He does not agree with proposals advanced from time to time that these relatively small deposits be mined as a group to support a full-scale blast furnace iron industry, but states that low-cost electric power offers the solution to eventual utilization of the Columbia River Basin iron ore resources. He believes that electric furnace metallurgy designed to produce special quality metals from unique ores may well be the pattern for utilization of the deposits.

Special Quality Metals

"The electric furnace augured well for small deposits of ore, small productions of ore per day, intermittent smelting, and making small tonnages of special grades of metal," he says. "Because the several tonnages of deposits of strange composition cannot be combined into a grand total tonnage of one mix but require that each deposit be dealt with separately, the availability of this new source of energy applied to ore reduction could well become the most auspicious happenstance of the decade for the Northwest states. 'Special quality metals for special uses' could well be made the slogan of the day."

In his recent review published in book form by the Raw Materials Survey of Portland, he declares that the nickel-bearing laterites near Cle Elum, Washington, are the best and largest deposit of nickel in the continental United States and Alaska. Regarding the desirability that this ore be tested by melting it to develop a nickel-iron alloy and make chromium a by-product, Mr. Zapffe reports:

"Recently Ravitz (Electric Smelting of Low Grade Nickel Ores; U. S. Bur. Mines R.I. 4122) tried electric arc smelting. His 47 tests proved that an essentially high-purity nickel-iron alloy can be made. By partial reduction more than 90 per cent of the nickel could be recovered as ferro-nickel containing up to 25 or 30 per cent nickel, and that a higher content could be obtained if a lesser recovery were permissible.

"In such reduction, he found that a slag emerges that contains the metals iron at about 50 per cent and chromium at about 2 per cent. Upon smelting this slag as one would a natural ore, but in the presence of excess carbon, he produced a metal that classes as chromium-bearing cast iron. Another test showed that a low-carbon steel can be made, in which work more than 90 per cent of the iron and about 50 per cent of the chromium is recovered."

More than 80 per cent of the West's output of copper and lead, and 60 per cent of the zinc comes from the Western states and about half of the aluminum pig is smelted in the Pacific Northwest from alumina shipped in from other states.

The West also has the greatest supply of lumber in the nation, and its lumber companies are more and more going in for tree planting to assure themselves of permanent supply for the future.

Population growth remains the key to distribution of much of the West's manufactured products. Its copper, lead, zinc, gold and silver, its canned, dried, and frozen fruits, vegetables and fish, its lumber, pulp, paper and plywood were mostly shipped to more populous areas in the past, but the West is becoming an increasingly more important market.

Steel Geared to West

Its steel industry, however, is geared mostly to serving the needs of the West, in the form of tin cans, stoves, water heaters, tanks, floor furnaces and other forms of space heaters, garbage cans, pipe for household plumbing, water mains, gas lines and all the other items required to take care of domestic and commercial needs. Automobile parts, oil well tools, and machinery are other important uses.

Aircraft production is sustained largely by military orders, and these have been large enough to keep the plants at a good rate, although the Seattle area suffered a shock last summer when the Air Force diverted to the Middle West considerable volume that had been expected would be put through the Boeing Seattle plant.

Assessing the Human Factor

Even more important than natural resources and climatic advantages is the human factor. The basic question here might be said to be "Is our industrial management manpower adequate to meet the demands that will be put upon it?" It all depends whether you see the good side of the picture, or the bad side, or balance them off against each other.

Some see a West full of enterprising young industrialists, who built ships in wartime faster than anyone else because they approached the job from an engineering standpoint rather than from traditional shipbuilding methods, who improvised workable answers to baffling aircraft problems, who developed a thriving steel industry in what was supposedly an "Orphan Annie" region, who are setting styles for the nation in clothing, furniture and homes, who are aggressively finding new markets for their goods.

Some see this wave of enthusiasm and enterprise sweeping all before it, building up a Western industrial empire controlled and staffed by Western talent.

Optimism vs. Pessimism

But some others see a West full of provincial top brass and inexperienced, underpaid and neglected middle management, who are hostile or indifferent to progressive operating methods, suddenly prosperous through no fault of their own, blind to the approach of competition such as they have never known because they came to the top through the production side in an era when no sales ability or experience was required, deaf to all proposals for more efficient management of their plants or for real sales effort.

These see Western enterprises due to go to the wall or sell out under the irresistible threat of Eastern firms backed by ample capital, directed by eagle-eyed master-minds and staffed by seasoned, thoroughly schooled subordinates who have the answers ready while the Western competitor is still floundering around trying to orient himself by the trial and error methods.

Easy to Oversimplicity

Yet to still others the foregoing characterizations are oversimplification, to say the least. As they see it, not all of the enthusiasm, enterprise and native ingenuity is confined to the West, and not all of the balanced judgment, careful planning and methodical operating is to be found on the other side of the Rockies. Not all of the Western-owned firms are going to be able to survive the "competitive fifties," nor is every sales-hungry Eastern industrial giant going to swallow up a resourceful and determined Western competitor.

Some Eastern companies now operating in the West, or preparing to invade the territory, somehow can't see over the Rockies. No real sales effort is expended on the West, and their Western branch managers are frustrated or indifferent. Contrariwise, many ambitious Western companies who think invading the East should be easy, will find themselves in a strange land with insurmountable handicaps. But many Eastern organizations are doing a first-class job in the West, and a growing number of Westerners have found they can sell their products right in Chicago, Detroit, and New York.

Industrially Youthful

Unquestionably the West is a young industrial territory, with much to learn about management, operating methods, engineering, research and sales. Many of its industries have flowered suddenly and the adjustment to a competitive economy may be painful.

One of the problems to be faced is education, particularly in the development of more advanced courses in engineering in our Western universities. A comparison of what Eastern schools have to offer with the sketchy courses provided in the West is likely to be surprising. Said one of the scientists connected with atomic energy development:

Educational Handicaps

"Several years ago I considered the possibility of obtaining a teaching position at a West Coast college or university. Based upon my experience in looking into this, it seemed to me at that time that too many engineering faculties and deans of engineering had never heard of metallurgy. Without a marked change in this condition among Western technological schools, and a resultant provision for instruction in metallurgy proportional to its importance, adequately trained personnel will never be available to Western metal industries in sufficient quantity to insure that their ultimate development will rival that of metal industries in the East."

Consequently, Western trained talent is under a heavy handicap in competing for jobs in Western industrial plants. A conspicuous example is aircraft engineering. Although the greatest concentration of aircraft production in the country is on the Pacific Coast, these plants find they have to go East to get most of their engineers, when there should be a first-class aircraft engineering school right in their own backyard.

Business administration departments of Western universities seem to be much alive to the needs and opportunities in the West. When the West is able to pluck Ralph Barnes, the country's top motion and time study man, out of Iowa and set him down at UCLA, it is pretty good evidence that in some areas of education the tide is flowing Westward.

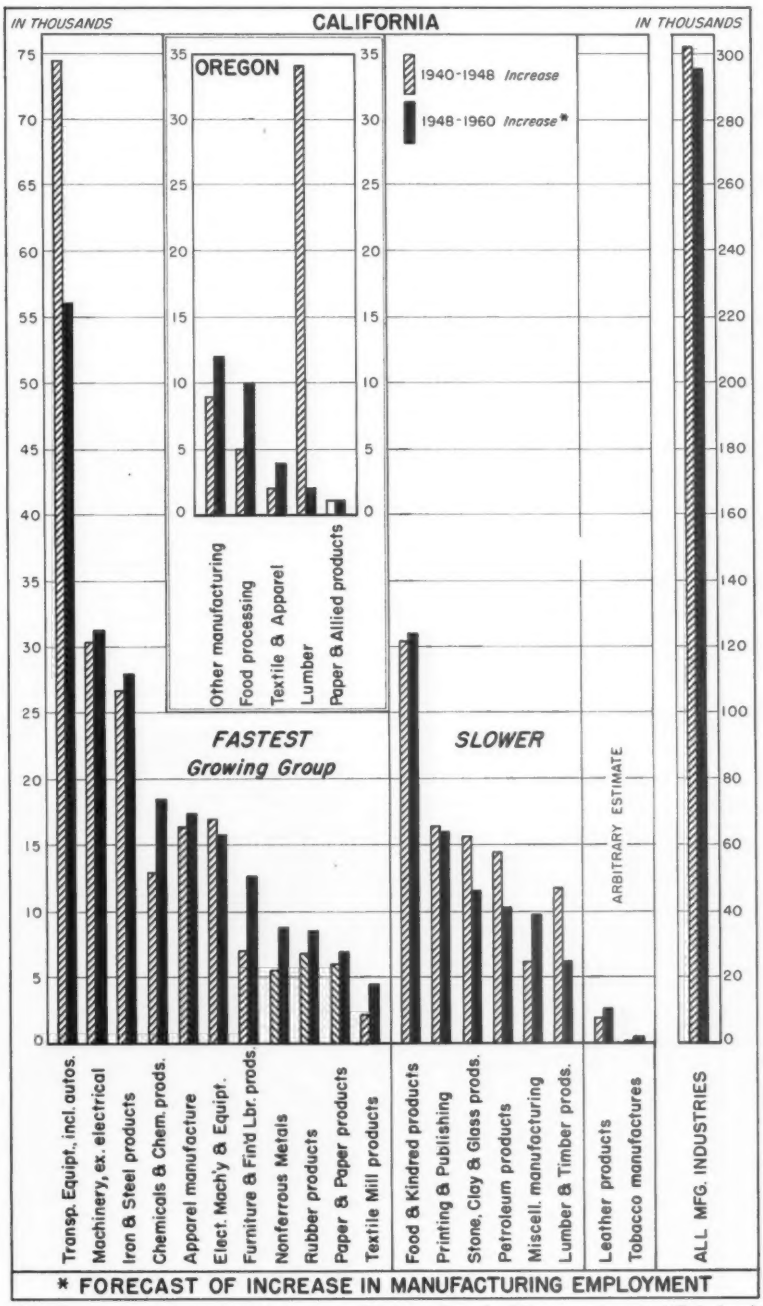
Influence of Atomic Programs

Last of all, attention should be called to the potential influence of the atomic energy programs on the West. Not the building of a huge testing station for peacetime uses of nuclear energy in Idaho, or the military development work at Hanford and Los Alamos, but the presence of forward-looking, deep-thinking technologists, whose ideas on many things are bound to impinge on the thinking of neighboring industrial management.

"The integration of technological innovations into normal industrial practice often cannot be detected," WESTERN INDUSTRY recently was informed by an atomic energy official. "As you know, practically all of the work of the Atomic Energy Commission is done through contracts with industrial or academic contractors. Including subcontractors, there are about 3,000 contractors all told.

"Many of these contractors produce unusual types of materials or equipment for the AEC requiring novel technology. There is no doubt that much of the technology used by these contractors to do these jobs will also be used in other types of processing. For example, a new valve, bearing or pump may have many applications beyond that for which it is developed. To put a finger on such applications is another thing, however.

"It may be possible to attack the problem of the possible technical advantages to industry in the West which may accrue from the Western atomic energy projects by investigating the motivation of some of the companies engaged in atomic energy work. Prestige and relatively small fees are not sufficient to explain the time, energy and brain-power which contractors are willing to expend—companies like General Electric, Westinghouse, Western Electric, Bendix, Monsanto, Carbide and Carbon, and many others."



(By Economics Technical Committee, Pacific Coast Board of Intergovernmental Relations)

"Era of Western Unity?" Growth Of Population Forces It!

New Economic Map of The West Created as Communities Come Closer to Each Other and State Lines Get Dimmer and Dimmer

By LOUIS B. LUNDBORG
Vice President, Bank of America
Past President, Western States Council

A FEW weeks ago, the press quoted estimates of the Bureau of Agricultural Economics that the population of the three Pacific Coast states might, by 1975, reach a total of 24,855,000. That is a big figure; but what does it really mean?

It means more than just putting two persons where there now is one, with the community patterns otherwise left unchanged. It means more than taking our present map and shading a little darker, and a little wider, the areas round our larger cities.

It means drawing a new economic map of the West.

As the pressure of population builds up in our present metropolitan areas, we can expect it to find outlets in currents and cross-currents that will ultimately form a whole new pattern of relationships in the West.

Old Boundaries Erased

The same forces that have brought a movement of people from the old centers of the East out to the Pacific Coast will cause—are already causing—a pushing out from the historic major centers of the West into formerly rural areas, the growth of new centers, and the erasing of old boundary lines.

We have seen what has already happened within the state of California. What used to be many cities and towns around San Francisco Bay is now one metropolitan area, grown together so solidly that the "City Limits" signs can hardly be seen behind a forest of stop lights, parking meters, street signs, and assorted other traffic directions.

The cities of Southern California have similarly fused together into another metropolis. And midway between San Francisco and Los Angeles, as well as in the areas beyond them, are growing up new cities and new centers, tying Northern and Southern California together in a manner that we never dreamed of in the days, twenty-odd years ago, when we just started to organize for "statewide unity."

Unity isn't even our academic question any more—it's just a state of being. There is just as intense competition as there ever was between cities and between the business firms in those cities; but any thought of economic isolation—of living behind Chinese walls, community by community—is a thing of the past. The interdependence of the several regions has been demonstrated too clearly to need further proof.

We might as well recognize now that the same thing is happening between states. The cities near the California-Oregon border, for instance, have such close ties with both states that the state line is becoming dimmer and dimmer business-wise; and their counterpart can be found in the border-line zones of most of our Western states.

LOUIS B. LUNDBORG

If that has been true before 1950, it will be increasingly true by 1975, if the population projections quoted above are borne out. Cities that have been only satellites of the major cities will become centers of economic influence in their own right; but in that process, they will only increase the importance of the present key cities, because they will be links in a stronger Western chain.

Mountain States Important

Most of the publicity about the population estimates has been centered on the figures for the three Coast states; but the drama of those figures should not obscure the importance of the forecast for the mountain states: estimates ranging up to a 26.4 per cent increase, bringing the totals for those states up to 6,072,000. That is not surprising; for even if the mountain states did not have the growth factors that are now present, they could not fail to feel the effects of a ten million increase in the neighboring Pacific Coast states.

In the face of those forecasts, the leaders of Western communities, of Western industry and commerce, can hardly fail to look at the West as an economic unit. Any planning for the future that does not take the entire area into account will not properly deserve to be called planning.

It was on such a premise that the Western States Council was founded. In less than five years, its usefulness has already been demonstrated; but as we enter the third quarter of the Twentieth Century, we enter truly the Era of Western Unity.

• **The helmsman can be an important figure. (Cartoon republished from the March, 1949, issue of *Western Industry*.)**

Now That This Era Is Upon Us, Where Will Be the Rallying Point?

LOUIS LUNDBORG'S picture of the West as it is already coming to be poses the question, "Now that the era of Western unity is upon us, where will the rallying point be?"

Although still in its infancy, the West has one over-all organization already in existence, the Western States Council. Born of a need for united action in regard to development of the West's steel industry after the war, its organization meeting at Salt Lake City in 1945 was the greatest turnout of industry the West has ever seen. Yet its subsequent activity has been on a minor scale, lacking any other immediately pressing problem.

But will this flowing together of Western areas pictured by Mr. Lundborg force the member chambers of the Council to send their top brass to the meetings of the Council instead of leaving everything to the staff executives of the chambers? Will other organizations representing industry in the West find themselves participating in deliberations and investigations? Or will a new channel be found for unity of the West to move in?

GUS BACKMAN
Salt Lake City
President, Western States Council

Western Industrial Market

Where $278,000,000 Was Spent in 1947 for New Plants and Equipment

IN THE next following pages of this issue (pages 33 to 80, inclusive) appears a recapitulation of the 1947* U. S. Census of Manufactures for the eleven Western states, reclassified by individual industries, along with reviews of outstanding developments of 1948 in some industries. Employment figures for 1947, more than double those of 1939, reveal industry growth.

Metals	35-37
Machinery	40-41
Chemicals	42
Electricity	43
Oil and Coal	44-45
Forest Products	46-52
Aircraft	56-57
Food Products	58-63
Furniture	66-67
Rubber	68
Motion Pictures	69
Ceramics	70-71

This material has been prepared for the benefit of all industrial concerns who need this picture (not available in this form anywhere else) for marketing purposes.

(A few of the lesser industries have been omitted from this issue, for lack of space, and the figures about them will appear in the February issue of WESTERN INDUSTRY.)

* Latest U. S. Census figures.

General Statistics and Distribution of Industrial Establishments by Employment Size Groups for 1947

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Montana	652	495	129	28	16,092	$43,481	8,802	13,606	$35,350	$92,258	$7,446
Idaho	664	491	144	29	16,907	45,748	9,854	14,602	37,904	109,694	11,447
Wyoming	256	201	42	13	5,607	16,696	3,351	4,285	12,291	34,957	10,235
Colorado	1,602	1,177	323	102	54,071	144,207	23,388	44,153	109,734	286,774	32,189
New Mexico	432	343	79	10	7,590	18,222	3,219	6,349	14,173	55,486	5,431
Arizona	545	420	100	25	14,188	39,333	5,905	11,167	29,680	103,958	8,328
Utah	772	546	173	53	24,516	63,804	11,467	19,973	48,053	128,298	16,988
Nevada	126	93	28	5	2,667	8,409	1,025	2,064	6,416	27,777	2,959
Total Mtn.	5,049	3,766	1,018	265	141,638	379,900	6,611	116,199	293,601	839,202	95,043
Washington	3,410	2,361	775	274	144,324	438,020	82,261	123,488	354,596	874,036	81,476
Oregon	3,075	2,105	737	233	105,591	317,287	57,487	92,144	265,837	675,017	61,669
California	17,648	12,657	3,820	1,171	663,872	2,064,523	271,290	530,283	1,519,255	3,994,981	410,533
Total Pacific	24,133	17,123	5,332	1,678	913,787	2,810,370	411,038	745,915	2,139,688	5,544,034	183,678
Total West'rn	29,182	20,889	6,350	1,943	1,055,425	3,190,270	417,649	862,114	2,433,289	6,383,236	278,721

Local Steel Supply A Big Help For Western Manufacturers

By A. B. TIETJEN
Manager of Purchases
Southwest Welding & Manufacturing Co.
Los Angeles

BEFORE the war we were dependent upon the east for nearly all of our steel tonnage. This placed the Western manufacturer in a most unfavorable position to compete even in his own area due to two-way freight which he must include in his costs.

He paid freight to the coast, and if he wished to send his product only a few hundred miles eastward, he was again faced with freight costs, whereas midwestern manufacturers and fabricators had only a one-way freight to pay on their westbound products.

Today we will have, including present construction to be completed in 1950, six blast furnaces with a capacity of 2,126,000 tons of pig iron per year, 45 to 50 open hearth furnaces, and nine electric furnaces with capacity of 4,000,000 tons of ingots per year.

Up to the war finished rolled products consisted of blue annealed and galvanized sheets, bars, universal plates, and standard structurals. During and since the war large tonnages of plate, tin plate, pipe, cold rolled strip, and cold rolled bars have been added. The tremendous growth of population together with the Western movement of industry requires a continuing larger tonnage of steel and a greater number of steel products. The steel industry is

PRIMARY METAL INDUSTRIES

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Montana	12	3	3	6	3,602	$10,661	2,270	3,132	$8,865	**	$293
Idaho	4	1	.....	3	948	3,240	569	828	2,663	$10,492	242
Colorado	47	29	9	9	7,880	$24,001	4,623	7,481	22,260	37,395	5,113
New Mexico	4	1	1	2	383	**	**	355	**	**	**
Arizona	12	2	1	9	3,420	10,382	2,001	2,975	8,644	43,351	460
Utah	24	12	3	9	6,544	19,920	2,546	5,484	16,076	34,099	4,300
Nevada	1	.....	.....	1	**	**	**	**	**	**	**
Total Mtn.	104	48	17	39	22,777	68,204	12,009	20,255	58,508	125,337	10,408
Washington	62	28	23	11	8,622	25,777	2,451	7,540	21,673	63,319	2,428
Oregon	52	28	17	7	3,002	8,946	529	2,560	7,513	19,782	618
California	482	286	131	65	30,878	97,837	12,810	26,027	78,188	176,014	39,251
Total Pacific	596	342	171	83	42,502	132,560	15,790	36,127	107,371	259,115	42,297
Total West'rn	700	390	188	122	65,279	200,764	27,799	56,382	165,879	384,452	52,705
Blast Furnaces and Steel Mills											
California	12	.....	1	11	11,205	$36,817	5,021	9,192	$29,088	$66,085	$31,272
Iron and Steel Foundries											
Colorado	21	10	7	4	1,068	$2,789	573	997	$2,509	$4,262	$141
Utah	10	5	3	2	790	2,195	481	704	1,795	3,452	272
Total Mtn.	31	15	10	6	1,858	4,984	1,054	1,701	4,304	7,714	413
Washington	27	12	13	2	1,079	3,286	476	986	2,778	4,717	167
California	131	41	63	27	8,743	26,822	4,394	7,883	22,827	39,895	2,756
Total Pacific	158	53	76	29	9,822	30,108	4,870	8,869	25,605	44,612	2,743
Total West'rn	189	68	86	35	11,680	35,092	5,924	10,570	29,909	52,326	3,156
Secondary Nonferrous Metals											
California	30	18	6	6	1,342	$4,170	362	1,003	$2,721	$11,434	$731
Gray-Iron Foundries											
Oregon	20	11	6	3	675	$1,913	173	613	$1,708	$2,937	$59
California	111	37	59	15	6,176	$19,035	3,161	5,630	16,465	28,907	2,132
Total Pacific	131	48	65	18	6,851	$20,948	3,334	6,243	18,173	31,844	2,191
Steel Foundries											
Oregon	5	.....	4	1	731	$1,997	295	558	$1,656	$3,320	$111
Nonferrous Foundries											
Colorado	16	14	1	1	261	$606	124	237	$551	$1,225	$11
Washington	15	12	3	.....	164	470	**	145	381	644	14
Oregon	16	12	4	.....	200	617	**	175	497	1,000	47
California	223	174	43	6	4,439	13,445	1,445	3,801	10,855	24,135	1,025
Total Pacific	254	198	50	6	4,803	14,532	1,445	4,121	11,733	25,779	1,086
Total West'rn	270	212	51	7	5,064	15,138	1,569	4,358	12,284	27,004	1,086
Miscellaneous Primary Metal Industries											
California	74	48	17	9	3,061	$9,926	1,050	2,542	$7,798	$18,991	$2,050
Iron and Steel Forgings											
California	23	11	10	2	781	$2,561	232	637	$2,029	$4,322	$445
Welded and Heavy-Riveted Pipe											
California	12	7	3	2	1,138	$3,864	488	979	$3,123	$7,426	$560

** Withheld to avoid disclosing figures for individual companies.

meeting this challenge and is doing its part to accelerate the growth of the West.

The West Coast, including Geneva, now has a total capacity of 3,136,700 tons annually as compared with approximately 1,255,000 tons before the war. This large capacity, together with the addition of such important products as rolled plate, tin plate, pipe, etc., places the Western states in a position of being much more self-contained and therefore less dependent upon distant eastern sources.

The effect of this has been first to provide Western manufacturers and fabricators with the steel they need at a price that is generally lower than eastern base plus freight, giving them a fair chance for existence and permitting our manufacturers to supply a larger area.

Second, the additional capacity and increased number of products permits Western concerns to operate on lower inventories than if these products had to be brought from the east with the added time in transit.

For example, a forge shop owner remarked to me that he could now obtain his billets from either of two Coast mills in three weeks time, whereas in all his existence he has brought his entire billet requirements to the Coast by boat and has had to calculate his inventory 60 days farther in advance and increase his stock accordingly. The same applies to many other types of manufacturers, permitting operation on a reduced inventory investment.

This, of course, also has its effect upon transportation and has greatly reduced the Westbound intercoastal steamer tonnage. As more products are added by Western mills, the future position of the West promises to be more and more favorable.

So extensive has expansion of this production been on the West Coast that eastern mills have withdrawn some products from Pacific Coast markets, leaving the area to Western producers.

As elsewhere, there is also on the Pacific Coast an increased use of stainless and high tensile alloys; especially in the oil, chemical, and paper industries.

What the West is principally interested in is the elimination of any phantom freight. It is gratifying that one of our largest companies has established at its Western mill, for the products rolled at the mill, a base price which is the same as the base at all of its eastern

THE WESTERN STEEL MARKET

Comparative steel shipments for 1940 and 1947 as prepared by the Martin Congressional committee investigating steel distribution.

COMBINED SHIPMENTS OF 11 STEEL PRODUCTS

Area	1940 Net Product Tons	1940 Per cent of Nat'l Total	1947 Net Product Tons	1947 Per Cent of Nat'l Total
Arizona	12,414	0.0878	41,331	0.1933
California	482,181	3.4090	749,408	3.5044
Colorado	30,448	0.2153	128,749	0.6021
Idaho	6,804	0.0481	8,051	0.0376
Montana	13,762	0.0973	16,563	0.0775
Nevada	3,040	0.0215	1,901	0.0089
New Mexico	24,403	0.1698	67,365	0.3150
Oregon	33,327	0.2356	53,392	0.2497
Utah	14,523	0.1027	21,290	0.0996
Washington	60,086	0.4248	73,739	0.3448
Wyoming	9,595	0.0678	41,228	0.1928
Total, Eleven Western States	690,203		1,203,017	

DETAILED FIGURES—SHEETS, STRIPS AND BARS

	SHEETS Hot-Rolled 1940	SHEETS Hot-Rolled 1947	SHEETS Cold-Rolled 1940	SHEETS Cold-Rolled 1947	STRIP Hot-Rolled 1940	STRIP Hot-Rolled 1947	STRIP Cold-Rolled 1940	STRIP Cold-Rolled 1947	BARS Hot-Rolled 1940	BARS Hot-Rolled 1947	BARS Cold-Finished 1940	BARS Cold-Finished 1947
Arizona	1,480	1,406	24	248	92	1,361	.....	73	3,662	5,101	12	391
California	130,274	194,542	17,572	37,180	9,535	16,580	4,941	10,968	96,730	118,998	7,682	25,342
Colorado	4,568	9,039	406	937	657	1,174	30	436	13,546	32,117	161	3,547
Idaho	1,330	858	2	49	179	100	1	.....	2,008	2,907	1	126
Montana	990	1,922	74	.....	88	21	.....	.....	2,320	2,886	79	31
Nevada	327	87	.....	18	19	.....	.....	.....	760	276	4	.....
New Mexico	471	725	.....	.....	68	113	.....	.....	6,051	4,793	12	6
Oregon	9,179	9,892	612	1,533	787	1,539	69	465	7,275	14,578	934	2,671
Utah	1,611	2,681	71	.....	182	272	1	22	6,116	9,544	209	405
Washington	12,957	18,017	965	3,021	2,339	1,967	72	338	25,534	23,242	741	1,869
Wyoming	43	346	.....	.....	10	4	.....	.....	1,690	1,571	.....	1

PIPE AND TUBING SHIPMENTS

	PIPE Butt-Weld 1940	PIPE Butt-Weld 1947	PIPE Lap-Weld 1940	PIPE Lap-Weld 1947	PIPE Seamless 1940	PIPE Seamless 1947	TUBING Electric Weld 1940	TUBING Electric Weld 1947	TUBING Mech. & Pressure 1940	TUBING Mech. & Pressure 1947
Arizona	4,788	5,824	324	781	1,793	25,450	221	689	18	7
California	84,846	155,982	6,712	18,447	109,405	146,603	10,894	13,313	3,590	11,453
Colorado	6,783	12,033	731	3,172	1,991	23,412	366	42,167	1,209	715
Idaho	2,879	3,604	185	280	202	55	5	22	12	50
Montana	4,440	4,530	2,068	861	3,226	5,979	453	239	24	94
Nevada	1,671	1,419	71	65	122	20	64	16	2	.....
New Mexico	3,835	7,949	1,402	3,374	11,698	50,130	485	218	1	57
Oregon	10,184	18,296	1,976	1,676	1,338	222	436	1,283	537	1,237
Utah	4,560	7,161	483	345	1,022	434	120	375	148	51
Washington	14,617	20,140	1,108	1,637	1,098	1,255	246	965	409	1,288
Wyoming	1,879	4,653	269	903	5,585	32,477	113	532	6	741

mills. This base, plus freight to Pacific Coast points, has given West Coast manufacturers a price which enables them to compete somewhat better with midwestern and eastern manufacturers, who could before that time, bring their product to the Coast against local competition. All West Coast industry has therefore benefited accordingly. As competition has already brought about more favorable prices, so will through competition our West Coast price picture further improve in the future.

I am sure that we who are responsible for the material costs in our companies feel that through competition *all steel products* rolled by Western mills will ultimately carry a base price that is close to the eastern base of those products. This will give the manufacturers of the West the cost basis they need to serve the West and a fair chance to compete for projects and products in the West.

Cutting a 33-inch bloom with a Linde Mogul cutting torch, known as a "bazooka," at Earle M. Jorgensen Co., Los Angeles. Capacity of this machine, 60 in.

FABRICATED METAL PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	All employees: Salaries & wages, total	Production workers: Number (average for year) 1939	Production workers: Number (average for year) 1947	Production workers: Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Montana	13	8	5	.....	278	$795	65	229	$637	$1,302	$47
Idaho	10	9	1	.....	106	278	35	88	219	404	36
Wyoming	2	.....	2	.....	**	**	**	**	**	**	**
Colorado	83	57	21	5	2,326	6,360	745	1,904	4,694	11,261	522
New Mexico	7	4	3	.....	151	508	**	99	293	758	139
Arizona	20	18	1	1	490	1,575	**	380	1,247	3,679	301
Utah	32	20	9	3	871	2,330	309	739	1,899	4,212	536
Nevada	2	2	.....	.....	**	**	**	**	**	**	**
Total Mtn.	169	118	42	9	4,222	11,846	1,154	3,439	8,989	21,616	1,581
Washington	198	141	46	11	4,663	14,724	2,066	3,877	11,571	26,719	1,138
Oregon	120	80	31	9	3,891	12,464	1,351	3,294	9,903	20,685	744
California	1,727	1,272	350	105	54,135	173,557	18,939	45,506	132,948	291,323	23,761
Total Pacific	2,045	1,493	427	125	62,689	200,745	22,356	52,677	154,422	338,727	25,643
Total West'rn	2,214	1,611	469	134	66,911	212,591	23,510	56,116	163,411	360,343	27,224
Tin Cans and Other Tinware											
California	27	7	6	14	5,238	$16,935	2,687	4,520	$14,037	$30,823	$2,884
Cutlery, Hand Tools and Hardware											
Colorado	12	7	4	1	531	$1,333	60	470	$1,047	$2,015	$123
Washington	16	13	1	2	382	1,168	95	304	867	1,703	125
Oregon	20	13	7	.....	351	1,118	40	284	796	2,208	52
California	183	144	33	6	4,155	12,625	932	3,448	9,078	24,041	1,198
Total Pacific	219	170	41	8	4,888	14,911	1,067	4,036	10,741	27,952	1,375
Total West'rn	231	177	45	9	5,419	16,244	1,127	4,506	11,788	29,967	1,498
Edge Tools											
California	11	8	3	.....	129	$384	15	113	$284	$695	$32
Hand Tools (not elsewhere classified)											
California	67	59	7	1	1,399	$4,478	215	1,112	$2,922	$8,333	$179
Hardware (not elsewhere classified)											
California	91	64	22	5	2,503	$7,470	662	2,115	$5,633	$14,465	$961

** Withheld to avoid disclosing figures for individual companies.

(Continued on next page)

FABRICATED METAL PRODUCTS—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Hand Saws and Saw Blades											
Oregon	4	1	3	.....	110	$349	**	82	$242	$511	$18
Heating and Plumbing Equipment											
Washington	29	17	9	3	1,081	$3,508	342	842	$2,548	$6,454	$225
Oregon	12	7	3	2	562	1,730	307	451	1,331	2,533	177
California	168	87	55	26	11,290	37,324	4,652	9,373	28,316	66,589	5,454
Total Pacific	209	111	67	31	12,933	42,562	5,301	10,666	32,195	75,576	5,856
Heating and Cooking Apparatus (not elsewhere classified)											
Washington	23	12	8	3	1,013	$3,292	305	787	$2,398	$6,202	$202
California	113	52	44	17	8,116	27,197	3,033	6,636	20,165	49,528	4,308
Total Pacific	136	64	52	20	9,129	30,489	3,338	7,423	22,563	55,730	4,510
Structural Metal Products											
Colorado	36	20	12	4	1,363	$3,998	518	1,090	$2,902	$6,997	$302
Arizona	15	13	1	1	476	1,553	**	366	1,225	3,624	301
Total Mtn.	51	33	13	5	1,839	5,551	518	1,456	4,127	10,621	603
Washington	89	62	23	4	1,779	5,928	948	1,546	5,011	9,275	378
Oregon	53	30	17	6	2,318	7,696	650	2,002	6,259	12,443	451
California	514	366	114	34	17,116	57,892	5,602	14,306	44,041	89,677	8,168
Total Pacific	656	458	154	44	21,213	71,561	7,200	17,854	55,311	111,395	8,997
Total West'rn	707	491	167	49	23,052	77,067	7,718	19,310	59,438	122,016	18,597
Structural and Ornamental Products											
Colorado	13	5	7	1	485	$1,361	225	413	$1,058	$2,984	$77
Utah	11	6	4	1	322	881	89	258	646	1,610	**
Total Mtn.	24	11	11	2	807	2,242	314	671	1,704	4,594	77
Washington	23	19	3	1	375	1,092	490	330	950	1,766	55
Oregon	12	5	5	2	780	2,682	173	672	2,191	3,591	80
California	161	105	43	13	5,742	18,815	2,309	4,663	13,982	30,682	1,758
Total Pacific	196	129	51	16	6,897	21,057	2,623	5,334	15,686	36,039	1,893
Total West'rn	220	140	62	18	7,704	23,299	2,937	6,005	17,390	40,633	1,970
Metal Doors, Sash and Trim											
California	48	34	11	3	1,043	$3,422	453	834	$2,462	$6,621	$547
Boiler Shop Products											
Washington	23	11	10	2	722	$2,538	**	623	$2,140	$4,481	$128
Oregon	13	6	3	4	1,023	3,286	**	893	2,717	5,793	158
California	82	49	21	12	6,602	23,046	1,249	5,639	17,498	30,290	4,270
Total Pacific	118	66	34	18	8,347	28,870	1,249	7,155	22,355	40,564	4,556
Sheet Metal Work											
Total Mtn.	10	7	3	.....	155	$398	51	140	$352	$746	$23
Oregon	25	17	8	.....	459	1,569	363	387	1,211	2,846	182
California	223	178	39	6	3,729	12,609	1,591	3,170	10,099	22,084	1,593
Total Pacific	248	195	47	6	4,188	14,178	1,954	3,557	11,310	24,930	1,775
Total West'rn	258	202	50	6	4,343	14,576	2,005	3,697	11,662	25,676	1,798
Metal Stamping and Coating											
California	426	357	62	7	6,849	$20,340	1,796	5,932	$15,751	$33,238	$3,066
Metal Stampings											
California	151	118	29	4	3,809	$11,724	1,012	3,156	$8,426	$18,884	$2,426
Galvanizing											
California	21	15	6	.....	305	$1,048	93	268	$809	$1,982	$64
Engraving on Metal											
California	16	13	2	1	227	$672	16	185	$487	$1,019	$38
Plating and Polishing											
California	211	187	23	1	2,087	$5,707	476	1,935	$4,983	$9,462	$334
Lighting Fixtures											
California	134	103	28	3	2,254	$6,746	661	1,853	$4,842	$13,068	$526
Fabricated Wire Products											
California	91	65	19	7	3,356	$10,018	1,565	2,883	$7,875	$15,284	$1,147
Wire Work (not elsewhere classified)											
California	80	54	19	7	3,313	$9,910	1,565	2,843	$7,785	$15,048	$1,113
Miscellaneous Fabricated Metal Products											
Washington	18	14	4	.....	247	$757	**	187	$509	$1,224	$60
Oregon	8	5	3	.....	121	350	**	97	243	538	11
California	184	143	33	8	3,877	11,677	1,044	3,191	9,008	18,603	1,318
Total Pacific	210	162	40	.....	4,245	12,784	.....	3,475	9,760	20,365	1,389
Steel Springs											
California	11	7	3	1	406	$1,108	147	304	$742	$1,370	$88
Bolts, Nuts, Washers and Rivets											
California	27	15	10	2	755	$2,409	147	602	$1,710	$4,636	$305
Screw-Machine Products											
California	85	71	12	2	1,103	$3,278	312	975	$2,780	$5,379	$389

** Withheld to avoid disclosing figures for individual companies.

NON FERROUS METALS . . . West is the big source

RAW MATERIALS FOR ALUMINUM

Prepared by Oregon and Puget Sound Chemical Market Research Groups

Figures in Tons

Item and Source	Portland Area	Tacoma-Spokane Area	Total
Aluminum (Louisiana)	400,000	264,000	664,000
Cryolite (Greenland)	15,000	1,650	16,650
Aluminum Fluoride (Missouri)		300	
Carbon	120,000	Not Reported	
Soda Ash (California)	Not Reported	300	
Petroleum Pitch (Oregon)	Not Reported	20,500	
Petroleum Coke (California)	Not Reported	58,000	

Estimated Ferroalloy Production in Washington Area

Prepared by Puget Sound Chemical Market Research Group

	Tons/Year
75% Ferrosilicon	2,000
50% Ferrosilicon	4,000
Ferrochrome	7,500

Copper

SINCE Daniel C. Jackling revolutionized copper mining more than 40 years ago by demonstrating that the low grade disseminated orebodies at Bingham, Utah, could be profitably worked, that industry has been the most alert in the whole field of mining to the possibilities of mechanization.

The trend during the past year has been, and the trend in the future will be, to adopt every new idea that will permit the handling of more ore at lower per ton cost.

Some of the most significant developments in the industry during the past year or two are:

Construction by Kennecott Copper Corp. of a $16,000,000 refinery near its Utah mine and mills.

Initial development of the low grade San Manuel properties in Arizona, perhaps the most important copper discovery in the past two decades.

Launching of a program by Anaconda Copper Co. to utilize the low grade ores in the Butte, Mont., district which have been bypassed while richer ores were available.

The Kennecott refinery, scheduled to be completed by the fall of 1950, represents a step forward in Western industrialization comparable to the establishment of basic steel plants in California and Utah.

The San Manuel enterprise, predicated on immense deposits of ore containing about .8 of one per cent copper, will necessarily be a fully mechanized, large scale, low cost, open pit operation.

Anaconda's program to extend the life of the Butte district is being held in abeyance for the time being because of economic factors. It contemplates the utilization of some 130,000,000 tons of ore carrying one per cent copper plus some gold and silver values. Economic feasibility is predicated on a reduction of mining costs by caving and greatly increasing volume.

The industry is in a strong position from an operational standpoint and the uncertainties of the future are economic rather than production question marks.

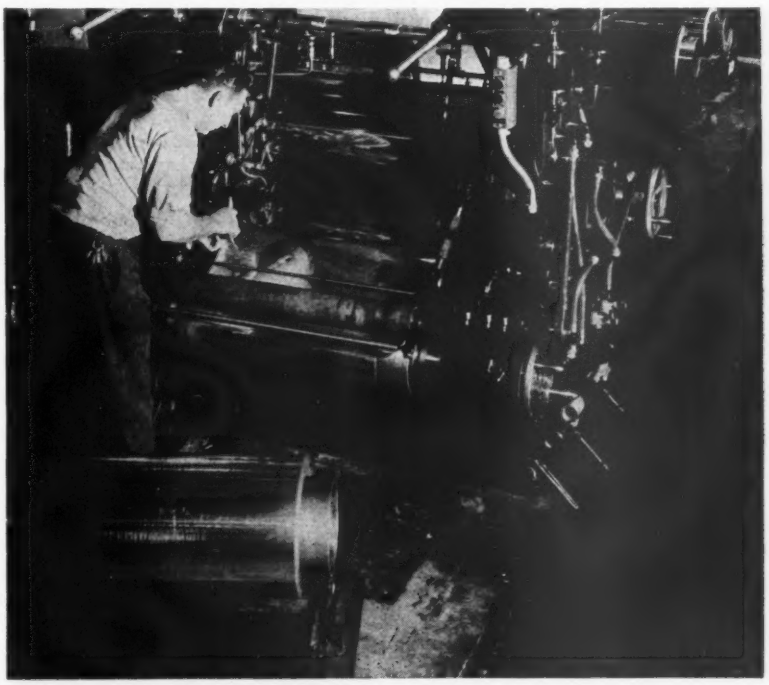
Aluminum

ALUMINUM developments in the last year include establishment of a foil plant at Permanente, Calif., near San Jose, by Kaiser Aluminum & Chemical Corporation, and construction of a wire, rod and cable mill at Vancouver, Wash., by the Aluminum Company of America.

The foil mill, which has a capacity of 6,000,000 pounds a year, got started in April and on the basis of December production was running about 59 per cent of capacity. At the new Vancouver mill, production of aluminum cable steel reinforced transmission cable is scheduled to start early this year. It is estimated that about 250 men will be employed in the cable mill, which adjoins Alcoa's reduction works at Vancouver.

Among the new products developed by the other Western Kaiser plants in the last year are alodized sheet, aluminum shade screening, embossing sheet, and roofing sheet, industrial roofing sheet, new types of siding, rolled formed structural shapes and a new general purpose alloy.

To help overcome shortages of electric power in the Pacific Northwest,all three of the aluminum operators, Alcoa, Kaiser, and Reynolds, have cut back production for the winter to the extent of one potline each, averaging from 20 to 25 per cent in volume. With good weather conditions providing more hydro power, full production may be resumed before the winter is out. About half of all the aluminum pig tonnage in the United States last year was produced in Pacific Coast plants.



• At Kaiser's foil mill plant, Permanente, Calif., sheet aluminum is run through a number of mills before it is rolled out to the desired size. Here is a run of aluminum foil being checked for precise thickness, in this case .00035 of an inch.

Postwar Freight Rate Increases Create Distribution Problems

By KENNETH L. VORE
Manager, Transportation Department
Los Angeles Chamber of Commerce

INCREASES in freight costs in the West since June 1946 have created competitive maladjustments upsetting many established marketing plans of Western industry.

Some Western producers have been forced to withdraw from markets formerly served. Others have found it necessary to establish branch manufacturing plants in market areas formerly served from relatively distant production facilities.

62 Per Cent Increases

Average rail freight rate increases on the Pacific Coast since 1946 have amounted to 62 per cent, with extra increases on numerous commodities of up to 133 per cent, and higher on some articles.

For example, the rail carload rates on steel bath tubs from Los Angeles to Portland, Oregon, have gone up from 59 cents per 100 lbs. in 1946 to $1.79 per 100 lbs. today—an advance of 203 per cent!

Here is how this situation came about: The average 62 per cent advance is the result of the three nationwide general rail freight rate increases authorized by the Interstate Commerce Commission. An extra increase of up to 50 per cent on the then-existing rates on many commodities was effected in September, 1946, by Pacific coastwise water lines.

How They Happened

This advance was simultaneously made in the rail rates by reason of mandatory provisions of a water-competitive "Fourth Section" order of the I.C.C., which required rail lines to maintain specific minimum "rate differentials" higher than competitive water rates.

Further rail rate increases were made necessary by withdrawal, entirely, of the "Fourth Section" relief by the I.C.C. in an investigation of water-competitive rail rates instituted at the request of the U. S. Maritime Commission.

The "Coastwise Case"

That investigation known as the "Coastwise Case," is now in its final phase. The water lines have alleged that present rates are so low that water service cannot compete. Water carriers and the U. S. Maritime Commission want the Interstate Commerce Commission to order the rails to further increase their rates.

Western industry, individually, and as represented by chambers of commerce and state Commissions, have protested any further rate advances, pointing out the already lost markets, and the certainty of further curtailment of shipments if additional rate increases are permitted.

KENNETH L. VORE

Pacific Coast rail lines have also protested against the further advances desired by the water lines. It was not known at press time whether or not additional rail rate advances might be made necessary by the forthcoming I.C.C. decision, which is anticipated by the end of 1949.

The End Is Not in Sight

But, even if the Coastwise Case does not result in further rate increases, the end is not yet in sight!

Rail carriers are now engaged, by order of the I.C.C., in revising their three freight classifications into a single "Uniform Freight Classification" for nationwide application. The I.C.C. apparently intends that most special "exceptions ratings" shall be cancelled at the time the uniform classification becomes effective.

Increases Coming Up

That would increase the costs of shipping less-than-carload quantities of many articles in the West.

Also, the I.C.C. named scales of class rates for use with the new uniform classification in the West, South and Midwest, but, no similar class rates were prescribed for use in the states located West of the Rocky Mountains (so-called Mountain-Pacific Territory), nor on transcontinental shipments.

Existing class rates in Mountain- Pacific and Transcontinental territories are generally on a higher level than the scale of rates prescribed by the I.C.C. for application in the East, Midwest, and South. If the proposed uniform classification becomes effective, nationwide, under these circumstances, West-

Editor's Note: **On Nov. 28 the I.C.C. instituted proceedings in Case 30416, calling for uniform class rates in Mountain-Pacific Territory. No hearings have been set as yet, and it is assumed the case will take two years or more before final settlement.**

ern shippers may be subjected to still further rate increases on many commodities.

Another danger to Western shippers lurks in the background behind this whole adjustment of class rates and classifications.

In the West, and on transcontinental movements, most shipments are subject to special "commodity rates" which have developed down through the years without any fixed relationship to the freight classification or class rates.

In the East, Midwest, and South, by contrast, most of the special rates lower than regular rates have been in the form of "exceptions to the classifications," which still have a fixed percentage relationship to the basic class rates and the classification. Even the "commodity rates," in the East, Midwest, and South, can be shown to be closely related, percentagewise, to the basic class rate structure.

When the I.C.C. ordered the rail lines to prepare the uniform classification, and at the same time established scales of class rates to be used with the new classification, the Commission indicated that the special "exceptions" to the classification were to be cancelled.

If that policy is followed in Mountain-Pacific and Transcontinental territories, as seems to be almost a foregone conclusion, then a vast shake-up and re-casting of our commodity rate structures, as well as our class rates can be expected.

In the light of the greater-than-average rate increases already sustained since 1946 by Western shippers as compared with the rest of the Nation, Western industry must be prepared to protect itself from further rate boosts in the next few years.

If it does not protect itself, further shrinkage of markets which can be economically served seems inevitable.

One encouraging development was the recent decision of the I.C.C. finding lawful the reduced rates on steel from Geneva, Utah, to Los Angeles, San Francisco, Portland, Seattle, and Spokane.

Without that vital rate adjustment Western industry would not have benefitted, pricewise, from the existence of two fully integrated Western steel mills. The old high rate from Geneva was virtually identical with the intercoastal water rate via the Panama Canal from the East Coast.

That made it possible for eastern steel mills to deliver steel at West Coast ports as cheaply as it could be obtained from Geneva. All of the steel producers in California, Washington, and Oregon pursued a policy of establishing Pacific Coast prices which equalled or exceeded the eastern base price plus the water freight rate to the Pacific Coast.

I.C.C. approval of the new lower Geneva rate has already resulted in the meeting of those rates by two competing railroads.

Other adjustments of steel rates in the West have been requested by interested steel mills. A realignment of numerous Western steel rates, on a lower level, is indicated.

Transportation costs and services are becoming of ever-increasing importance to the economy of the Pacific Coast. Transportation affects the establishment of industry and in many cases determines the success of that industry.

Recent increases in transportation rates and other economic factors have dislocated many market distribution areas. It is essential, therefore, that those engaged in the receipt of raw materials for the manufacture and distribution of products therefrom, acquaint themselves with transportation economics, costs and services on which their future may well depend.

Intra-Territorial Shortline

Intra-territorial shortline average haul per ton of 305 miles in the Mountain Pacific Territory is the highest in the country. Comparable average hauls were 173 miles in Western Trunk Line Territory; 205 in Southern Territory; 231 in Official Territory; 270 in Southwestern Territory.

Inter-territorial shortline average haul per ton for Mountain Pacific Territory is 747 miles, also the nation's longest; for Official and Western Trunk Line, 261; for Southern, 333; and for Southwestern, 439.

Except for Official Territory in reaching markets in Southwestern Territory, and vice versa, only the Mountain Pacific Territory consumers and producers have to defray transportation charges for shortline average hauls per ton of more than 1,000 miles when receiving or shipping products inter-territorially.

NOTE: For purpose of tariff boundary definition, the nation is divided into the following Territories, (roughly) established as:

Western Trunk Line: West of Chicago, St. Louis, and Illinois, Wisconsin, Minnesota, Iowa, northern half of Missouri, Kansas, Nebraska, North Dakota, South Dakota, and eastern half of Colorado;

Southwestern: Texas, eastern New Mexico, Oklahoma, Arkansas, and southern Missouri;

Mountain Pacific: Eleven Western states except eastern half of Colorado and eastern half of New Mexico;

Official: All territory east of the Mississippi River and north of the Ohio River;

Southern: Southern part of Virginia, North Carolina, South Carolina, Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida.

POSTWAR FREIGHT RATE INCREASES TRANSCONTINENTAL AND PACIFIC COAST TERRITORIES

	Percentage Increases			
		Transcontinental Territory		
Date Effective	*Pacific Coast Territory*	*North Atlantic*	*South Atlantic*	*Gulf*
September 26, 1946	50%①	.....	.....	.....
January 1, 1947	20%	22½%	20%	20%
Aug. 15, and Sept. 15, 1947	5%②	2½%③	5%②	5%②
January 1, 1948	Variable	.....	.....	.....
May 6, 1948	20%	25%	25%	20%
September 1, 1949	8%	9%	9%	8%
Total Compounded Increases as of September 1, 1949	133¼%③④	70 5/16%	70 5/16%	62%
	62% ①⑤			

① Did not apply uniformly, nor to all commodities (Water Competitive Rates).
② Applied only to certain commodities in the Rail/Water Investigations.
③ Does not include 5% increase September 15, 1947.
④ Does not include variable increases January 1, 1948.
⑤ Does not include 50% increase September 26, 1946.

MORE STEEL RATE ADJUSTMENTS

Following recent approval by the Interstate Commerce Commission of lower steel rates from the Geneva mill in Utah to the Pacific Coast, railroads operating in the West have adjusted the rest of the pattern to give all other steel mills in the West equal advantages.

From San Francisco and Los Angeles area points to Utah, the same rate of 63c, or $12.60 a ton, as had been established on westbound shipments now will apply eastbound. The previous rate was 91c. Related rates into Idaho were provided slightly higher than to Salt Lake City.

New rates from California into the Northwest are as follows:

San Francisco to Portland, 67c (or $13.40 a net ton). Old rate 89c.
San Francisco to Seattle, 74c. Old rate 95c.
San Francisco to Spokane, 77c. Old rate $1.31.

This is 4c higher to Portland and Seattle than from Geneva to these points, and 14c higher to Spokane. San Francisco rates to the Northwest will be 10c under southern California, or $2 a ton.

Readjustment of rates from Coast points into Arizona and New Mexico was re-docketed.

Rates mentioned above are for minimum carloads of 80,000 lbs. and apply to basic iron and steel listings.

MACHINERY . . . Both supply and need grow

MACHINERY (except electrical)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Montana	10	8	2	.....	107	$262	80	86	$200	$321	$27
Idaho	11	7	3	1	312	886	67	235	675	1,194	122
Wyoming	7	5	2	.....	124	312	13	111	262	752	16
Colorado	101	61	30	10	4,504	12,645	1,164	3,631	9,492	22,550	1,546
New Mexico	6	6	.....	.....	32	75	**	30	68	115	13
Arizona	16	14	1	1	359	**	51	316	**	**	**
Utah	17	7	8	2	717	2,119	209	549	1,455	3,215	303
Nevada	3	3	.....	.....	8	**	**	8	**	**	**
Total Mtn.	171	111	46	14	6,200	16,299	1,584	4,966	12,152	28,147	2,027
Washington	181	139	33	9	5,312	17,367	1,862	4,221	12,929	25,233	1,562
Oregon	129	101	18	10	3,817	12,453	1,145	3,030	9,463	19,463	587
California	1,621	1,229	289	103	52,477	167,639	12,616	40,043	119,221	284,785	22,631
Total Pacific	1,931	1,469	340	122	67,806	197,729	15,623	47,294	141,613	329,481	25,367
Total West'rn	2,102	1,580	386	136	74,006	214,028	17,207	52,260	153,765	357,628	27,394
Engines and Turbines											
California	18	6	2	10	4,022	$12,468	435	2,991	$8,801	$16,359	$857
Tractors and Farm Machinery											
Colorado	19	13	6	.....	364	$1,119	89	288	$752	$2,764	$391
Washington	18	15	2	1	434	1,322	**	307	826	1,554	239
Oregon	14	11	3	.....	200	680	**	172	526	991	47
California	119	85	25	9	3,633	11,188	351	2,848	8,154	14,432	4,375
Total Pacific	151	111	30	10	4,267	13,190	351	3,327	9,506	16,977	4,661
Total West'rn	170	124	36	10	4,631	14,309	440	3,615	10,258	19,741	5,052
Tractors											
California	9	7	.....	2	358	$1,249	**	271	$824	$2,162	$95
Farm Machinery (except tractors)											
Idaho	7	5	1	1	235	$686	**	174	$495	$893	$87
California	110	78	25	7	3,275	9,939	**	2,577	$7,330	$12,270	$4,280
Total West'rn	117	83	26	8	3,510	10,625	.....	2,751	7,825	13,163	4,367
Construction and Mining Machinery											
Colorado	16	3	8	5	1,747	$4,792	443	1,372	$3,432	$9,403	$415
Utah	4	.....	3	1	397	1,277	**	274	772	1,968	157
Total Mtn.	20	3	11	6	2,144	6,069	443	1,646	4,204	11,371	572
Washington	19	11	5	3	1,706	5,818	705	1,380	4,343	8,396	249
Oregon	7	3	2	2	401	1,247	162	310	952	2,915	90
California	108	49	35	24	7,960	26,703	2,954	6,052	18,638	54,002	3,122
Total Pacific	134	63	42	29	10,067	33,768	3,821	7,742	23,933	65,313	3,461
Total West'rn	154	66	53	35	12,211	39,837	4,264	9,388	28,137	76,684	4,033
Oil-field Machinery and Tools											
California	56	18	23	15	5,305	$17,996	2,238	3,978	$12,491	$38,770	$2,058
Metalworking Machinery											
Washington	15	14	.....	1	514	$1,699	224	388	$1,276	$2,139	$58
Oregon	8	6	1	1	201	577	88	155	425	953	13
California	238	208	27	3	2,612	8,389	626	2,098	6,395	13,999	960
Total Pacific	261	228	28	5	3,327	10,665	938	2,641	8,096	17,091	1,031
Machine Tools											
California	15	13	2	.....	138	$416	**	109	$307	$723	$53
Metalworking Machinery (not elsewhere classified)											
California	37	26	8	3	1,173	$3,886	348	852	$2,576	$6,149	$229
Cutting Tools, Jigs, Fixtures, Etc.											
California	186	169	17	.....	1,301	$4,087	**	1,137	$3512	$7,127	$678
Food-Products Machinery											
Oregon	8	5	3	.....	148	$562	53	117	$407	$902	$82
California	106	73	26	7	3,827	$12,653	628	2,956	9,144	21,921	1,002
Total Pacific	114	78	29	7	3,975	13,215	681	2,973	9,551	22,823	1,084
Woodworking Machinery											
Washington	17	7	9	1	680	$2,246	283	566	$1,685	$3,852	$182
California	38	29	8	1	678	2,046	51	500	1,409	3,660	165
Total Pacific	45	36	172	2	1,358	4,292	334	1,066	3,094	7,512	347
Special-Industry Machinery (not elsewhere classified)											
Colorado	16	11	3	2	1,136	$3,499	80	919	$2,704	$4,272	$92
Washington	43	28	13	2	1,172	3,898	352	990	3,024	6,496	326
Oregon	46	36	8	2	956	3,192	186	813	2,497	4,621	185
California	356	291	55	10	7,923	24,211	1,803	5,875	17,959	41,096	3,718
Total Pacific	445	355	76	14	10,051	31,301	2,341	7,678	23,480	52,213	4,229
Total West'rn	461	366	79	16	11,187	34,800	2,421	8,597	26,184	56,585	4,321
General Industrial Machinery											
Colorado	14	6	5	3	744	$1,953	411	608	$1,560	$3,588	$379
Washington	22	14	7	1	751	2,492	114	569	1,816	3,713	527
Oregon	15	10	1	4	1,277	4,172	344	884	2,853	5,599	203
California	198	111	64	23	9,592	31,948	2,449	6,819	20,226	55,979	3,306
Total Pacific	235	135	72	28	11,620	38,612	2,907	8,272	24,895	65,291	4,036
Total West'rn	249	141	77	31	12,364	40,565	3,318	8,880	26,455	68,879	4,415

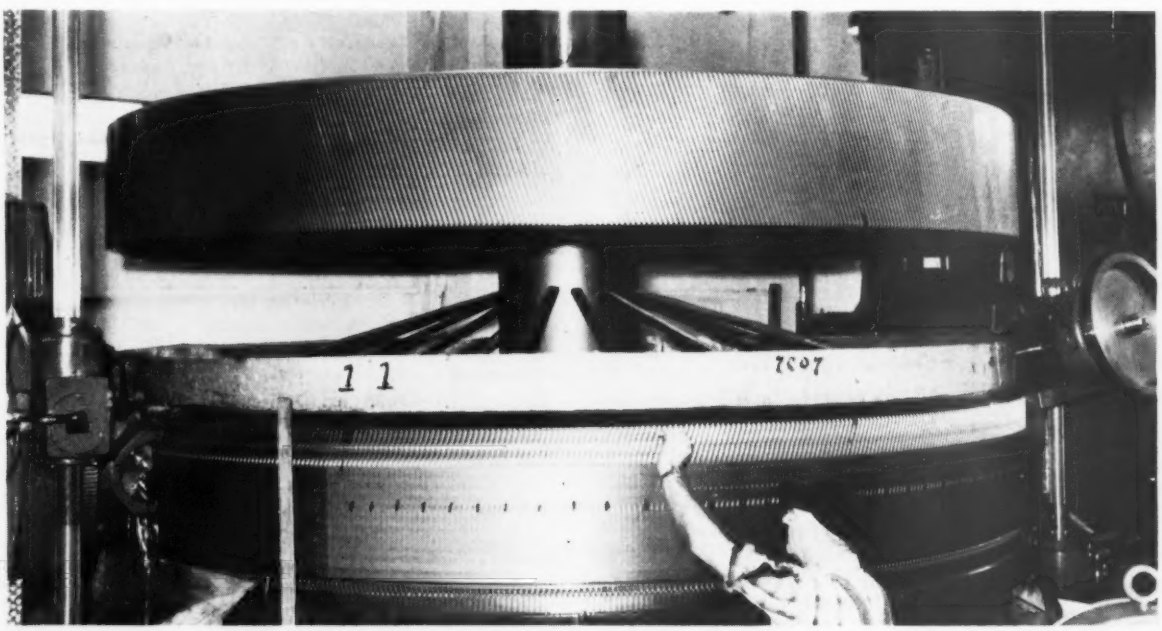
** Withheld to avoid disclosing figures for individual companies.

MACHINERY—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Pumps and Compressors											
California	64	30	22	12	4,581	$15,040	1,419	3,237	$9,651	$27,513	$2,225
Elevators and Escalators											
California	13	7	6	.....	341	$1,192	76	185	$581	$2,251	$23
Conveyors											
California	17	10	5	2	763	$2,656	206	493	$1,486	$4,656	$171
Blowers and Fans											
California	18	9	7	2	701	$2,249	131	520	$1,441	$4,200	$201
Industrial Trucks and Tractors											
California	15	12	3	.....	226	$901	28	151	$466	$978	* *
Power-Transmission Equipment											
California	31	20	7	4	1,295	$4,353	170	1,026	$3,149	$6,565	* *
Office and Store Machines											
California	31	24	4	3	3,851	$11,337	672	2,952	$7,983	$19,631	$2,229
Computing and Related Machines											
California	6	2	1	3	3,609	$10,625	480	2,769	$7,495	$18,187	$2,131
Office and Store Machines (not elsewhere classified)											
California	15	12	3	.....	196	$565	* *	139	$350	$1,070	$91
Service and Household Machines											
Washington ..	13	12	1	.....	121	$349	41	102	$290	$379	$13
California	91	61	19	11	4,656	14,809	770	3,794	10,627	23,165	1,194
Total Pacific..	104	73	20	11	4,777	15,158	811	3,896	10,917	23,544	1,207
Refrigeration Machinery											
California	49	29	10	10	4,026	$12,887	706	3,303	$9,302	$19,771	$980
Miscellaneous Machinery Parts											
Colorado	24	19	5	.....	253	$669	56	231	$587	$1,448	$75
Washington ..	47	41	5	1	597	1,744	349	471	1,319	2,469	148
Oregon	32	28	3	1	726	2,432	327	645	2,073	4,112	45
California	462	394	58	10	8,228	26,586	2,556	6,614	20,428	46,122	2,870
Total Pacific..	541	463	66	12	9,551	30,762	3,232	7,730	23,820	52,703	3,063
Total West'rn	565	482	71	12	9,804	31,431	3,288	7,961	24,407	54,151	3,138
Valves and Fittings (except plumbers')											
California	50	33	10	7	3,864	$12,855	608	2,893	$9,387	$21,265	$1,107
Machine Shops											
Washington ..	42	37	4	1	542	$1,554	324	429	$1,173	$2,180	$125
Oregon	24	21	2	1	631	2,131	320	569	1,840	3,301	11
California	379	339	38	2	3,544	10,935	1,660	3,048	8,897	19,691	1,365
Total Pacific..	445	397	44	4	4,717	14,620	2,304	4,046	11,910	25,172	1,501

* * Withheld to avoid disclosing figures for individual companies.



• Big machines are made in the West, too. These two huge bull gears are being hobbed at Westinghouse's Sunnyvale plant. A rough cut takes 90 hours; finish cut, 120. Once started, the finish cut cannot be stopped. Hobbers equipped with battery power which switches on immediately in case of power failure. Room and oil temperatures must register constant 78 to 80° F.

CHEMICALS . . . West a big storehouse

STATISTICS scattered through this issue of WESTERN INDUSTRY give a good picture of the importance of the West as a chemical market and also as a producing area.

In the development of agricultural chemicals, petroleum derivatives and wood by-products, the West has played an important part.

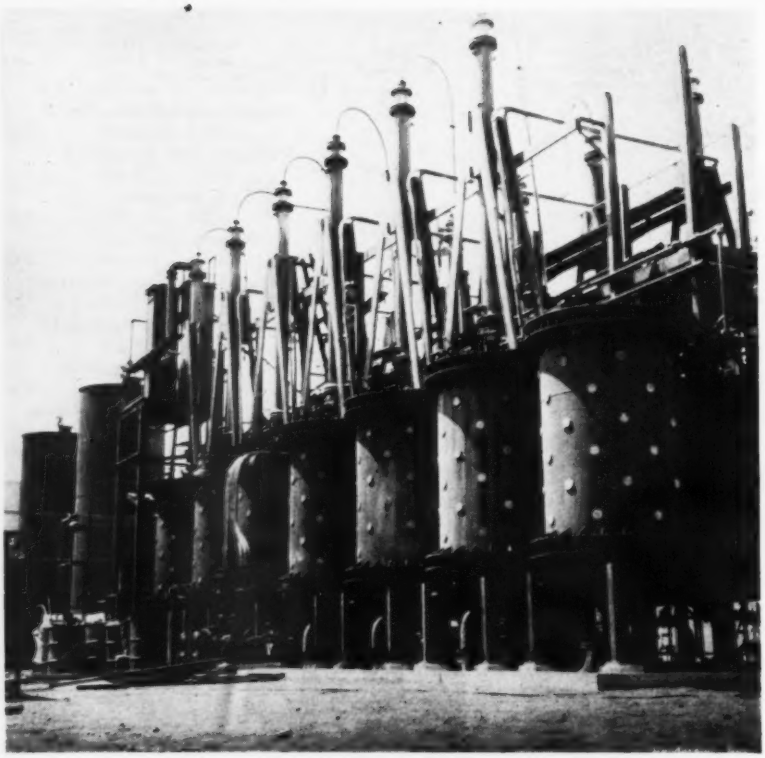
Finished products of the California surface coatings industry are estimated by the Western Chemical Market Research Group to have more than $120,000,000 for 1948. This represented approximately 52,000,000 gallons of various kinds of paints, requiring 31,300,000 pounds of linseed oil, 10,000,000 pounds of soybean oil, 50,000,000 pounds of synthetic resins, 12,000,000 pounds of natural resins, 30,000,000 pounds of petroleum solvents, and 171,000,000 pounds of pigments.

Fertilizer consumption in California is estimated by the same group at 550,000 tons and agricultural mineral sales almost 500,000 tons.

Chemicals Used by Explosives Industry—Washington Area

Prepared by Puget Sound Chemical Market Research Group

Material	Lbs./year
Ethylene Glycol	300,000
Glycerine	600,000
Mixed Acid	4,500,000



• Alcoholator at Montrose Chemical Co. installation at the big Basic Magnesium plant, Henderson, Nev., where important electro-chemical industries are developing.

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
CHEMICALS AND ALLIED PRODUCTS					
Montana	10	435	342	$2,149	$329
Idaho	7	149	126	1,609	260
Wyoming	3	25	21	33	.....
Colorado	62	1,275	818	8,271	1,575
New Mexico	10	1,237	1,052	13,738	3,040
Arizona	23	616	485	5,771	412
Utah	30	642	540	5,112	346
Nevada	6	379	289	3,115	668
Total Mtn.	151	4,758	3,673	39,798	6,630
Washington	115	2,086	1,367	15,570	3,324
Oregon	69	1,155	792	11,750	2,296
California	847	27,350	19,096	280,195	38,478
Total Pacific	1,031	30,591	21,255	307,515	44,098
Total Western	1,182	35,349	24,928	347,313	50,728
Industrial Inorganic Chemicals					
California	38	4,486	3,347	$31,758	$9,599
Alkalies and Chlorine					
California	5	409	394	$3,193	** **
Inorganic Chemicals (not elsewhere classified)					
California	33	4,007	2,953	$28,565	** **
Industrial Organic Chemicals					
Utah	3	220	193	$1,782	$54
California	31	3,167	2,217	37,474	7,095
Total Western	34	6,774	2,410	39,256	7,149
Organic Chemicals (not elsewhere classified)					
California	14	1,757	1,199	$20,200	** **
Explosives					
California	5	664	539	$6,069	$331
Drugs and Medicines					
California	102	2,620	1,602	$19,046	$1,206
Pharmaceutical Preparations					
California	83	2,228	1,339	$15,089	$687
Soap and Glycerin					
California	27	1,708	1,137	$32,660	$1,417
Printing Ink					
California	14	482	379	$5,428	$509
Chemical Products (not elsewhere classified)					
California	107	1,047	675	$9,541	$1,400
Paints and Allied Products					
Colorado	8	280	155	$1,606	$306
California	178	4,905	3,177	51,709	4,078
Total Western	186	5,185	3,332	53,315	4,384
Insecticides and Fungicides					
California	19	573	416	$4,905	$941
Paints and Varnishes					
California	155	4,467	2,811	$45,070	$3,876
Inorganic Color Pigments					
California	9	355	302	$5,727	$180
Fertilizers (mixing only)					
California	47	827	594	$5,384	$1,092

** Withheld to avoid disclosing figures for individual companies.

ELECTRICITY . . . Western demand increases

RECENT advances in uses of electricity have been significant. Sawmills, for instance, are finding that it is cheaper and more dependable to use purchased electric power than independently generated power. A rapidly expanding trend in that industry is indicated as more and more mills are becoming completely electrified.

Actually, the bare cost per KWH is less for independently generated power, but such installations require maintenance labor as well as considerable capital outlay. As little as one per cent loss in mill production offsets that difference. Nearly every mill established this year in northern California, at least, is completely electrified and operates on purchased power.

Electric welding processes are having more and more bearing on Western industrial economy. Although these machines use only a comparatively small amount of electricity, they require heavy lines to carry the peak demands. Manufacturers of metal articles are turning gradually toward the use of electrical welding in fabrication processes. It is cheaper and faster than riveting or tapping and threading, where such replacement operations are feasible.

General Electric has come out with a device to control electric motor speeds, from maximum to as little as 30 per cent of maximum speed. Such an improvement on motors will undoubtedly be welcomed by industries that require variable speed motors. It should step up motor sales as well as electrical consumption, and open new industrial processes.

The San Francisco Mint has installed high frequency induction melting processes, eliminating gas-fired equipment. High frequency operations of this nature are particularly beneficial to users of metal alloys, since the metal is not only melted; it is kept in constant state of agitation, rather than allowed to heat in strata.

Paraffine Companies, in Emeryville, are now using mercury vapor lights to inspect and grade linoleum. Although these lights are common in industry, and frequently used to inspect metals, here is a new application that may have extensive industrial use with non-metals.

Westinghouse has come up with a fluorescent sun lamp — a tube much the same as an ordinary fluorescent light tube, but one that gives off rays comparable to the sun's rays.

Dielectric heating is being adopted more and more in industry. Particularly widespread uses of it this year developed in the plywood industry as well as the furniture industry.

• View of production facilities at Lenkurt Electric Co., San Carlos, California. The transformer winding process is illustrated, with a couple of finished transformers seen on the bench at left.

ELECTRICAL MACHINERY

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees			Production workers				
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Wyoming	1	1	.....	.....	**	**	**	**	**	**	**
Colorado	11	7	4	.....	294	**	37	215	**	**	**
Arizona	3	2	.....	1	194	**	.....	171	**	**	**
Utah	3	3	.....	.....	8	$12	**	7	$11	$21	$1
Total Mtn.	18	13	4	1	496	12	37	393	11	21	1
Washington	23	16	6	1	827	2,332	159	716	1,902	4,594	141
Oregon	25	18	4	3	880	2,464	100	774	1,979	5,039	354
California	396	266	87	43	17,622	53,649	3,878	14,177	39,502	106,603	7,908
Total Pacific	444	300	97	47	19,329	58,445	4,137	15,667	43,383	116,236	8,403
Total West'rn	462	313	101	48	19,825	58,457	4,174	16,060	43,394	116,257	8,544
Electrical Industrial Apparatus											
California	148	90	39	19	8,374	$25,891	1,616	6,513	$18,531	$48,347	$3,848
Electrical Measuring Instruments											
California	16	13	2	1	267	$923	12	184	$563	$1,748	$83
Electrical Control Apparatus											
California	35	17	13	5	2,119	$6,551	705	1,611	$4,566	$12,954	$686
Electrical Welding Apparatus											
California	10	6	3	1	297	$1,131	**	197	$610	$1,821	$57
Electrical Industrial Apparatus (not elsewhere classified)											
California	17	13	3	1	345	$902	7	263	$576	$1,493	$50
Electrical Appliances											
California	26	17	5	4	2,147	$6,366	584	1,857	$5,147	$12,684	$839
Communication Equipment											
California	135	94	26	15	5,108	$15,105	790	4,137	$11,094	$30,886	$2,528
Radios and Related Products											
California	76	48	19	9	3,230	$9,108	533	2,631	$6,525	$16,534	$469
Miscellaneous Electrical Products											
California	73	58	12	3	1,320	$4,376	631	1,105	$3,331	$10,460	$548
Storage Batteries											
California	40	25	12	3	1,120	$3,842	546	941	$2,938	$9,435	$520

** Withheld to avoid disclosing figures for individual companies.

PETROLEUM . . . Ample supply

Biggest event of 1949 in the U. S. Petroleum field was an astounding change from acute shortage to comfortable surplus.

This happened although overall demand did not decline materially and demand for some products actually increased. Gasoline consumption, for instance, at year's end was running about five per cent above last year's rate.

The Miracle

The miracle, which ended fears of a winter oil "crisis," was accomplished by:

(1) Finding of more oil through drilling of an estimated 37,000 exploratory wells, nearly equal to 1948's 40,000 "wildcats."

(2) Completion of a number of refinery expansions, many of them begun shortly after end of the war.

(3) Amazing increase in foreign oil production, particularly in the Middle East, reducing Marshall Plan exports, diverting more to U. S. domestic markets, and bringing strong competition in world markets from devalued "sterling oil."

The changed supply picture immediately set in motion a chain of compensating trends.

Prices softened. "Wildcatting" began to decline, despite lower drilling costs. A number of contracts for import of South American oil were terminated. Many marginal or "stripper" wells were shut down as prices of lower grades of crude declined.

In Texas and other states where proration is legally mandatory, production was reduced, and in others, major companies voluntarily pinched down on supply.

On the West Coast, which produces a disportionately large share of the nation's heavy crude, yet consumes an unusually large share of the lighter petroleum products such as gasoline and motor oils, the glut of low-gravity oil brought drastic moves. Prices of bottom-grade crudes tumbled. Many wells were closed down as unprofitable. Some refineries began installing equipment to produce more light and fewer heavy components from the crude.

The Strike Helped

The prolonged shipping strike contributed by stopping movements of the ships which refuel on the West Coast where bunker oil normally is cheap. Major producers arranged to ship 5,000,000 barrels of residual oils to the East Coast, first large movement in more than a decade.

New pipeline undertakings were projected to bring oil from Colorado's and Wyoming's booming new fields to the Pacific Northwest, and to transport Alberta gas into British Columbia and Washington.

Largest such project ever built by private capital in U. S. was completed, a 1000-mile line from West Texas and New Mexico fields to Illinois.

Early price declines encouraged eastern consumers to postpone refilling their tanks until cold weather approached.

Caught Short

Many probably were caught short when coal strikes intensified the squeeze on production and transportation facilities, but at year's end the changes there were would be no serious hardship for industrial users nor home folks.

Important technical advances were made by the Bureau of Mines and cooperating major companies in the search for alternative source of oil in case of war emergency.

First tests of a new shale retorting process at Rifle, Colorado, established tentative production costs said to be in the neighborhood of $2.50 per barrel, with the prospect of further reductions under large-scale operation. A coal gasification plant also was opened by the Bureau in Missouri to explore costs of synthesizing liquid fuels from coal.

PETROLEUM AND COAL PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Montana	12	5	4	3	567	$2,018	440	479	$1,657	$7,855	$535
Idaho	1	.....	.....	1	**	**	**	**	**	**	**
Wyoming	22	8	7	7	2,230	8,255	1,004	1,587	5,824	18,363	9,061
Colorado	14	7	6	1	791	2,844	441	693	2,391	9,607	4,712
New Mexico	8	3	5	.....	**	**	**	**	**	**	**
Arizona	3	3	.....	.....	26	**	**	15	**	**	**
Utah	9	2	4	3	1,427	4,610	380	1,158	3,571	12,222	897
Total Mtn.	72	28	26	15	5,041	17,727	2,265	3,932	13,443	48,047	15,205
Washington	8	6	1	1	204	**	74	139	**	**	**
Oregon	8	3	5	.....	332	**	23	262	**	**	**
California	132	70	38	24	21,472	74,990	9,504	17,227	56,994	213,503	41,241
Total Pacific	148	79	44	25	22,008	74,990	9,601	17,628	56,994	213,503	41,241
Total West'rn	220	107	70	40	27,049	92,717	11,866	21,560	70,437	261,550	56,446
Petroleum Refining											
Wyoming	22	8	7	7	2,230	$8,255	**	1,587	$5,824	$18,363	$9,061
California	68	27	24	17	18,813	66,362	8,639	15,120	50,628	187,034	39,055
Total West'rn	90	35	31	24	21,043	74,617	8,639	16,707	56,452	205,397	48,116
Paving and Roofing Materials											
California	36	20	10	6	2,048	$6,669	830	1,660	$5,059	$20,128	$1,843
Paving Mixtures and Blocks											
California	19	13	5	1	391	$1,335	142	250	$808	$3,829	$391
Roofing Felts and Coatings											
California	17	7	5	5	1,657	$5,334	688	1,410	$4,251	$15,975	$1,452

** Withheld to avoid disclosing figures for individual companies.

COAL . . . Huge reserves

From a technological standpoint the intermountain bituminous coal industry is in the best condition in its history. Its chief worries are markets and competition (pricewise) of other fuels.

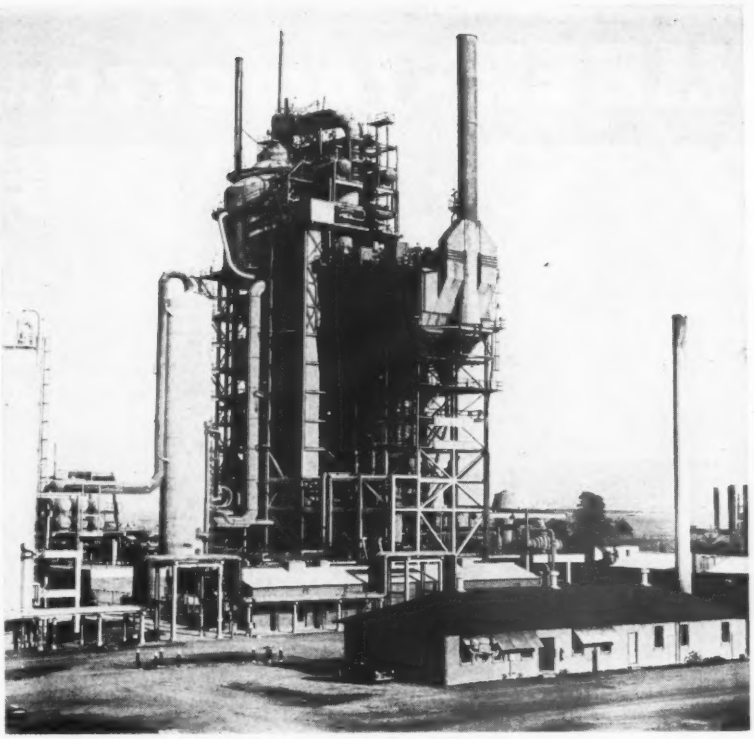
Perhaps for a few scattered truck mines, which account for only about 8 per cent of the tonnage produced, Utah mines are as fully mechanized as possible until someone invents new machines. The Wyoming industry is highly mechanized. Colorado, which has a larger number of small mines and produces several varieties of coal, is spotted but in the main the industry in that state is fully mechanized.

During this past year operational improvements have consisted largely of replacing machines and equipment with newer models.

One potentially important contribution to coal mining, which is not yet in use in this area, is the Joy continuous miner. Several major companies have placed orders but none has been able to obtain delivery as yet. The Utah Fuel Company is scheduled to get one in the near future for its Sunnyside mine.

Until the machines have been tried out in intermountain coal seams and under operating conditions existing in those fields, operators are reluctant to forecast just how successful they will be. But it can be said that they are awaiting with high expectations the initial tests.

"The machines," said one Utah operator, "are infinitely better than they were two years ago and I am confident they will be an important contribution to the industry."



• Fluid catalytic cracking unit of Avon, Calif. Tide Water Associated Oil Co.

• Coal mining is one of economic mainstays in the intermountain states. Here are miners helping to increase Geneva Coal Mine's tonnage, near Geneva, Utah.

One major advance made by the industry in recent years has been installation of mechanized cleaning equipment, of both the dry and the wet variety. But the basic installations in this field were made just prior to the war with subsequent expansions and improvements.

Intermountain coal, incidentally, is exceptionally clean as mined and does not require the extensive cleaning that some eastern and midwest coals do.

Some of the small truck mines have recently mechanized their operations and virtually none of them does any hand mining any more.

To summarize briefly, it can be said that the intermountain industry is keeping up with the operational advances being made anywhere in the nation.

A potentially important field for the industry in the future lies in the processing of coal to produce smokeless fuel, liquid fuel and various other by-products. A great deal of research work has been done but with few tangible commercial results thus far. Among the organizations pressing for more effort in this direction are the various coal producers' associations, private firms or individuals which have worked out processes and the Association for Modern Uses of Wyoming Coal, in which Governor A. G. Crane is very active.

TIMBER—tomorrow's growing

By HAROLD OLSON
Western Field Representative
American Forest Products Industries, Inc.

WHEN lake states timber cruisers headed West 75 years ago and all but swooned at sight of the trees, they said "these forests will last forever."

The same statement is made today, but for a different reason.

It's true that the West has a colossal supply of standing sawtimber to draw from — 1,043,000,000 board feet, according to latest government figures. That's enough to build 100,000,000 five-room homes. It's enough wood to build a sidewalk 750 feet wide to the moon.

But vast as it is, this visible woodpile has a limit somewhere. So it's the invisible timber supply, the trees of tomorrow, that now must be reckoned with.

Back of the standing sawtimber is a still greater resource — the growing power of the forest. It manifests itself in a mighty phalanx of logs that pushes itself up out of the ground little by little, year by year, steadily and inexorably. It starts here and ends in infinity.

That's the principle behind the new tree farm program of timberland owners. They are trying to harness fully the self-renewing power of the woods. They seek to create continuous crops of timber. They are aiming at "forests that last forever" through constant growth.

The tree farm program is still young, having been founded in 1941, but already in the West there are 324 certified tree farms totaling more than 6,000 acres. About half this acreage is in the Western Pine region, half in the Douglas fir region of western Washington and Oregon. In the California Redwood region there are plans afoot to join the movement shortly.

It was in Grays Harbor county, Washington, that the first tree farm was established by the Weyerhaeuser Timber Company just a few months before Pearl Harbor. Spontaneous acceptance met the plan from the first—from the public, operators and land owners. In following years the program gained momentum and prestige, and today is established in 26 states, with a total of 2,011 units of 19,161,000 acres, according to recent figures from American Forest Products Industries, Inc., which keeps the national record.

• When a tree like this comes down, far-sighted lumbermen can replace it.

g supply!

The vital hallmark of the tree farm movement is that it continues to maintain a healthy growth. In the West it has nearly doubled in the past three years. Hundreds of thousands of acres are in line to join in 1950. More and more small woodland owners, farmers and others, are coming in.

Tree farms can be large or small, thousands of acres or 10 acres, industry-owned or held by individuals. But they are all taxpaying lands, for this is a private enterprise program that is out to do an important job in the national economy without appropriations from the public purse. At the same time, it has the blessing and active support and cooperation of state and federal forestry agencies. In fact, in some eastern states the state forestry department is the sponsoring agency.

The "Tree Farm" sign does not necessarily mean that the property is "on sustained yield." It does denote that here is forest land deliberately managed to grow trees as a crop.

"Sustained yield" is something else, Paul Bunyan's Utopia, so to speak. It is a goal — to balance growth with withdrawal. "Withdrawal" takes in all sources, including insects, disease and fire. These latter items, unpredictable, bring uncertainties into the picture.

"Selective logging" is another misunderstood term. It doesn't mean sustaining yield in itself. It could, of course, but actually the only sure meaning of the phrase is selective logging—harvesting trees by selection, either by individuals or areas or blocks. It is a method of forest management, and a well tested and approved one for specific areas and circumstances.

There are two certifying agencies in the West for the tree farm program. In the pine region it is the Western Pine Association, with offices in Portland. In the Douglas fir region it is the Forest Conservation Committee of the Pacific Northwest Forest Industries. Should a program be launched in the redwood region, the California Redwood Association will probably be the sponsor.

In sizing up the tree farm movement as it pertains to the West, one should not lose sight of the fact that in itself it can't provide the full solution to the forest future problem even if its objectives were fully attained. That's because less than half the commercial forest land of the West is in private ownership. The West counts 107,000,000 acres of commercial forest land and of that, 69,000,000 acres are in public ownership. The rest is the tree farm field. That more than 6,000,000 acres already have qualified for tree farm rating is seen as a yardstick of the program's acceptance.

How effective is the movement? Is it resulting in the growing of more trees? The answer is "Yes." Not only are long-range prospects improving on properties already certified, but the lessons taught by tree farm talk and practices tend to bring more owners into the fold. The very existence of the tree farm program has educational value not only to forest land owners but to the public too.

Moreover, the rise of the tree farm program has brought more sharply into focus the tremendous problems of forest management, the difficulties that line the path of the forest future. Forest pests, for instance, and insects, disease and fire. Such problems are real. They are not easily licked. Tree farmers are face to face with them right now.

Full forest production is the goal of the tree farmers. Maybe the objective will be a long time in attainment but there has been progress already. The pattern has been set, and the light is green.

"We can no longer afford idle or half-idle land," says Col. W. B. Greeley, prominent Western forester. "Our object should be to maintain in full production all land that is capable of growing a useful crop and not required for other purposes. That is our job."

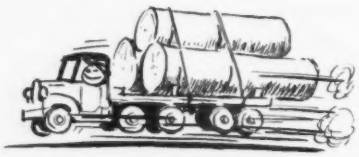
• Timber put to good use helped build today's great Western industrial empire; tomorrow's greater empire needs more of it.

LUMBER . . . West has the big timber stands

THERE will be a continued trend toward integration of wood-using industries in lumber's future in the West, increasing demand for dry lumber, and more emphasis by the producers to market lower grades and minor species.

Public Sentiment

Public sentiment has been bringing about steadily improving forestry practices, but steadily diminishing supplies of wholly virgin timber and the coming of age of second growth forests, plus accumulating "know how" in logging practices are also providing good economic reasons for effective better clean-up in the woods and greater utilization of woods means much more of a mixed diet in sizes and species for mills to handle.



Integration Is the Word

Thus, on the mill end, integration of plants that can divert wood to its best end uses, whether that be lumber, plywood, pulp, or other minor products, seems to stand squarely on the

LUMBER AND PRODUCTS, EXCEPT FURNITURE

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with				All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Montana	210	154	50	6	4,874	$12,549	2,197	4,562	$11,297	$22,053	$2,519
Idaho	233	165	54	14	7,629	21,410	5,583	7,137	19,474	43,396	2,747
Wyoming	76	64	11	1	900	1,987	863	856	1,849	3,566	312
Colorado	188	159	27	2	2,282	5,020	1,192	2,151	4,435	8,106	953
New Mexico	92	67	21	4	1,910	4,002	1,497	1,855	3,824	8,250	425
Arizona	70	50	17	3	2,530	6,776	1,364	2,103	5,871	12,620	2,169
Utah	79	69	10	.....	647	**	179	596	**	**	**
Nevada	8	4	3	1	405	**	108	360	**	**	**
Total Mtn.	956	732	193	31	21,177	51,744	12,983	19,620	46,750	97,991	9,125
Washington	911	602	222	87	43,034	134,993	37,803	40,096	120,838	279,458	19,510
Oregon	1,390	906	368	116	51,532	164,203	31,621	48,082	147,956	363,561	29,817
California	1,276	922	275	79	38,477	123,349	24,082	35,445	109,516	226,183	23,145
Total Pacific	3,577	2,430	865	282	133,043	422,545	93,506	123,623	378,310	869,202	72,472
Total West'rn	4,533	3,162	1,058	313	154,220	474,289	106,489	143,243	425,060	967,193	81,597
Sawmills and Planing Mills, General											
Montana	190	143	43	4	3,970	$10,126	**	3,744	$9,278	$17,462	$2,095
Idaho	205	146	45	14	7,225	20,479	5,314	6,758	18,624	41,809	2,584
Wyoming	65	55	9	1	689	1,473	6,091	6,057	1,385	2,656	263
New Mexico	82	63	16	3	1,209	2,758	1,266	1,177	2,680	5,181	342
Utah	52	49	3	.....	301	577	**	291	557	953	30
Total Mtn.	594	456	116	22	13,394	35,413	12,671	18,027	32,524	68,061	5,314
Oregon	1,231	824	315	92	41,915	133,892	27,196	39,222	121,326	300,513	26,422
California	667	453	155	59	25,470	84,424	16,030	23,583	75,839	155,955	18,604
Total Pacific	1,898	1,277	470	151	67,385	218,316	43,226	62,805	197,165	456,468	45,026
Total West'rn	2,492	1,733	586	173	80,779	253,729	55,897	80,832	229,689	524,529	50,340
Millwork Plants											
Montana	9	4	3	2	675	$1,805	**	616	$1,484	$3,377	$307
Colorado	26	22	3	1	401	967	223	369	863	1,297	132
Arizona	9	7	2	.....	135	396	85	125	339	687	32
Utah	19	14	5	.....	275	699	100	248	568	1,125	78
Nevada	6	2	3	1	401	1,318	103	356	1,075	1,579	455
Total Mtn.	69	49	16	4	1,887	5,185	511	1,714	4,329	8,065	1,004
Washington	131	60	39	32	12,388	41,857	7,285	11,395	36,598	81,076	3,887
Oregon	76	36	23	17	6,227	$20,662	1,598	5,655	17,956	46,835	2,495
California	293	224	65	4	6,341	20,037	**	5,732	17,246	33,344	1,922
Total Pacific	500	320	127	53	24,956	82,556	8,883	22,782	71,800	161,255	8,304
Total West'rn	569	369	143	57	26,843	87,741	9,394	24,496	76,129	169,320	9,308
Lumber and Timber Basic Products											
Colorado	146	129	16	1	1,422	$2,892	831	1,374	$2,745	$4,914	$389
Arizona	52	38	12	2	2,088	5,478	1,128	1,706	4,825	10,289	1,867
Total Mtn.	198	167	28	3	3,510	8,370	1,959	3,080	7,570	15,203	2,256
Washington	721	508	161	52	28,857	88,173	28,752	27,074	79,859	189,946	15,091
Oregon	1,239	826	319	94	42,893	136,740	27,886	40,154	123,946	304,946	26,601
California	677	463	155	59	25,522	84,536	16,147	23,634	75,948	156,257	18,670
Total Pacific	2,637	1,797	635	205	97,272	309,449	72,785	90,862	279,753	651,149	60,362
Total West'rn	2,835	1,964	663	208	100,782	317,819	74,744	93,942	287,323	666,352	62,618
Wood Preserving											
Washington	15	5	10	.....	575	$1,785	351	502	$1,538	$3,727	$250
Oregon	7	2	4	1	362	1,111	231	334	961	2,468	287
California	11	4	7	.....	441	1,484	245	400	1,284	4,738	296
Total Pacific	33	11	21	1	1,378	4,380	827	1,236	3,783	10,933	833

** Withheld to avoid disclosing figures for individual companies.

(Continued on next page)

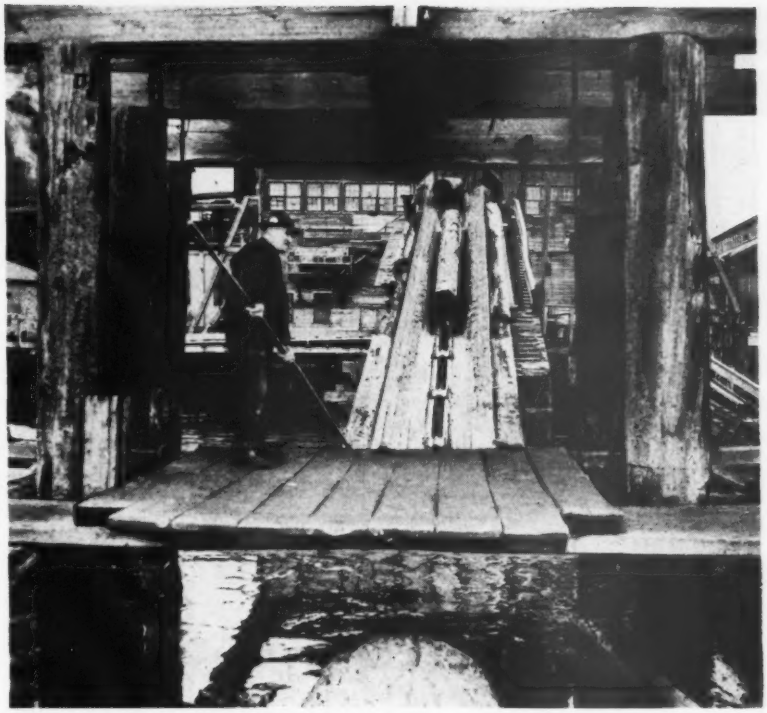
road to both better forestry practice and higher production efficiency.

The Weyerhaeuser Timber Company's big plant at Longview, Washington, is no doubt the best current example of such integration. At Longview, Weyerhaeuser manufactures both sulphite and sulphate (kraft) pulp, plywood, lumber, bark products, and Prestologs, a compact fuel made from planing mill wastes.

Integration will no doubt be most easily accomplished by the larger organizations, with access to big scale capital, but integration may be expected to develop also through cooperative pooling of the facilities and holdings of otherwise independent plants.

The future will see less and less rough green lumber thrown on the market. Lumber in that form is marginal and often becomes a distress product. The answer lies in much greater expansion of new dry kiln capacity and the modernization of present dry kilns which have become outdated. Lumber drying processes are increasingly carried on under scientifically controlled conditions.

Also to be expected is much more refinement of lumber at, or near, the source of first manufacture. This will mean the installation of more surfacing and detailing machinery. Such machinery will have to operate at high speed feed rates to compete. This in turn means larger individual runs on a given item to avoid idle machine time. Another development which many expect to see materialize on the Coast is the manufacture of cut stock to supply, with pieces cut to exact size, the requirements for such secondary manufacturers as furniture manufacturers, for example.



• Hauling logs from log pond to the sawmill on a bull chain, at Pope & Talbot's, Port Gamble, Washington. This year marks Pope & Talbot's centennial in business.

In the bygone days of vast stands of beautiful, large old growth timber, lumber of much higher quality than required for a specific service was marketed. Now, with a higher percentage of smaller and rougher trees, second growth, etc., new emphasis is given to marketing lumber of lower grades, but perfectly suited for intended uses. Some further fabrication techniques, such as the gluing up of smaller pieces to make wider or larger and clearer pieces of lumber can also be expected to develop in the lumber industry.

LUMBER AND TIMBER, EXCEPT FURNITURE—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Wooden Boxes (except cigar boxes)											
California	104	72	24	8	3,042	$8,683	2,868	2,850	$7,808	$17,209	$1,114
Miscellaneous Wood Products											
Montana	11	7	4	.....	229	$618	* *	202	$535	$1,214	$117
Idaho	13	7	6	.....	228	571	173	217	532	1,040	128
Wyoming	6	4	2	.....	174	438	* *	162	388	807	36
Total Mtn.	30	18	12	.....	631	1,627	173	581	1,455	3,061	281
Washington ..	40	23	15	2	1,167	3,332	532	1,054	2,931	6,130	461
Oregon	49	32	15	2	1,112	3,195	490	1,049	2,893	5,921	453
California	165	145	15	5	2,229	5,935	994	2,053	5,156	12,628	749
Total Pacific..	254	200	45	9	4,508	12,462	2,016	4,156	10,980	24,679	1,663
Total West'rn	284	218	57	9	5,139	14,089	2,189	4,737	12,435	27,740	1,944
Prefabricated Wood Products											
Washington ..	13	7	4	2	418	$1,203	137	357	$930	$1,378	$81
California	11	5	4	2	541	1,926	* *	448	1,432	2,280	341
Total Pacific..	24	12	8	4	959	3,129	137	805	2,362	3,658	422
Wooden Containers											
Washington ..	19	11	7	1	622	$1,631	1,414	573	$1,450	$2,306	$71
Oregon	26	12	11	3	1,300	$3,606	1,647	1,224	3,161	5,859	268
California	122	82	32	8	3,437	9,733	3,204	3,216	8,708	18,929	1,180
Total Pacific..	161	101	47	13	5,155	14,542	4,988	4,797	12,799	26,166	1,529

** Withheld to avoid disclosing figures for individual companies.

PULP & PAPER . . . More of it coming West

AN awakening public consciousness on the subject of polluted waters in the Pacific Northwest is heralding important changes in pulp manufacturing techniques. Commercial fishermen and sportsmen have been particularly vocal on the subject, but have not been alone. However, with steady progress being made in the installation of treating plants to neutralize domestic sewage, the pulp industry increasingly looms up as a major target.

Economically, the facts are that present pulp processes, generally speaking, result in the discharge as waste of a very large percentage of the total wood volume consumed in pump manufacture and also in the loss of chemicals used in the process.

One of the largest producers, the Weyerhaeuser Timber Co., has now converted its sulphite pulp mill at Longview, Washington, from a calcium base process to a magnesium base. The change-over necessitated heavy new investment in plant, particularly in chemical recovery facilities, but the benefits gained have been a high recovery of chemicals and the conversion of hitherto wasted portions of the wood (principally lignin) to fuel. The process is available to competitive plants on a royalty basis.

The near future will no doubt see the installation of many new recovery

PULP PRODUCTION

Prepared by Oregon and Puget Sound Chemical Market Research Groups

Estimated Annual Production for 1949, in Tons

	Oregon, and Clark and Cowlitz Counties of Washington	Puget Sound Area	Total
Unbleached and bleached sulfite pulp	493,480	750,000	1,243,480
Sulphate or kraft pulp	465,375	210,000*	675,375
Mechanical or groundwood pulp	178,850	140,000	318,850
Total	1,137,705	1,100,000	2,437,705

(Note: Oregon group figures actually are in production capacity, rather than actual production)

PAPER PRODUCTION

Annual, in Tons

	Oregon, and Clark and Cowlitz Counties of Washington	Puget Sound Area	Total
News	111,325	(Of total pulp production of 1,100,000 tons, 40% converted to paper in the area, 60% shipped to other parts of the country, particularly the East.)	
Sulphites	198,925		
Sulphates	197,100		
Book	82,125		
Board	226,000		
Others*	180,675		
Total	996,450	450,000	1,446,450

PAPER AND ALLIED PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Idaho	1	1	.....	.....	**	**	**	**	**	**	**
Colorado	14	4	10	.....	613	**	150	524	**	**	**
Arizona	2	2	.....	.....	**	**	**	**	**	**	**
Utah	3	1	2	.....	141	**	**	122	**	**	**
Total Mtn.	20	8	12	.....	754	.....	150	646	.....	.....	.....
Washington	63	7	23	33	12,876	$42,596	8,129	11,433	$35,922	$137,670	$28,859
Oregon	38	14	8	16	4,551	14,348	3,060	4,034	12,263	34,653	5,879
California	201	90	73	38	12,128	36,491	5,424	10,320	28,536	80,710	16,373
Total Pacific	302	111	104	87	29,555	93,435	16,613	25,787	76,721	253,033	51,111
Total West'rn	322	119	116	87	30,309	93,435	16,763	26,433	76,721	253,033	51,111
Envelopes											
California	15	6	6	3	718	$2,179	331	616	$1,603	$3,921	$654
Paper Bags											
California	16	5	6	5	1,038	$2,826	282	876	$2,094	$7,622	$985
Paperboard Containers and Boxes											
California	73	27	33	13	5,072	$14,884	1,931	4,403	$12,004	$30,808	$4,126
Paperboard Boxes											
California	70	27	30	13	4,947	$14,577	**	4,295	$11,752	$30,352	$4,113
Fiber Cans, Tubes, Drums, Etc.											
California	3	.....	3	.....	125	$307	**	108	$252	$456	$13
Pulp Goods and Miscellaneous Paper Products											
California	67	43	17	7	2,098	$5,874	473	1,699	$4,222	$13,205	$2,553
Converted Paper Products (not elsewhere classified)											
California	48	30	12	6	1,722	$4,814	362	1,392	$3,443	$11,424	$2,395
Pulp, Paper and Paperboard											
Washington	35	.....	8	27	10,170	$35,347	6,987	9,044	$29,949	$125,827	$27,669
Oregon	16	1	3	12	3,558	11,799	2,680	3,199	10,281	27,801	5,241
Total Pacific	51	1	11	39	13,728	47,146	9,667	12,243	40,230	153,628	32,910
Pulp Mills											
Oregon	9	1	2	6	1,310	$4,328	**	1,181	$3,785	$16,585	$1,718
Washington	20	.....	4	16	6,288	22,427	3,850	5,597	19,145	95,169	20,764
Total Pacific	29	1	6	22	7,598	26,755	3,850	6,778	22,930	111,754	22,482
Paper and Board Mills											
Washington	15	.....	4	11	3,882	$12,920	3,137	3,447	$10,804	$30,658	$6,905
Oregon	7	.....	1	6	2,010	6,762	**	1,819	5,906	9,587	3,523
Total Pacific	22	.....	5	17	5,892	19,682	3,137	5,266	16,710	40,245	10,428

** Withheld to avoid disclosing figures for individual companies.

plants, shifting from the calcium base to either a magnesium or ammonia base cooking process. Once installed, important economies accrue to the plant in the manufacturing process. However, the capital investment is quite high, and, perhaps unfortunately for the smaller plants, there is not much spread in costs between the largest size mills and the smallest one. In other words, the larger mills will probably come out of this anti-pollution move with a better competitive advantage than ever.

Recovery of chemicals and fuel values from pulp liquor wastes will also affect, for the better, the fuel and power requirements of pulp plants. The fuel situation has already been changed by the installation over recent years of hydraulic log barkers. These have resulted in more economical operation from the labor standpoint and, even more importantly, the saving of very substantial volumes of sound pulping wood which was lost previously under mechanical barking, except for relatively low fuel values. The overall trend is away from a dependence on wood waste for a pulp plant's heat and power requirements.

LUMBER STANDARDS

An average Douglas fir log, from a tree approximately 100 years or older, will produce from the outside of the log only about 17 per cent clears; that is, lumber without knots or other defects, and most suitable for interior and cabinet work where appearance and fine finish are essential.

Twenty-two per cent of the log will grade select structural. It is from this part of the log that timbers and framing (material subjects to heavy stresses and where strength is a factor) are produced. Twelve per cent will be select merchantable, a grade most suitable for use as exterior or exposed sheathing where appearance is most important.

The balance of the log, 49 per cent, produces the No. 1, 2, 3, and 4 Common. No. 1 and No. 2 is general utility lumber suitable for joints, rafters, studding, sheathing, sub-flooring, etc. No. 3, the next lower grade will give good service as studding, sheathing, and sub-flooring where economy is a primary consideration. No. 4 may be utilized for dunnage and in temporary construction.

Other species of lumber are covered by separate sets of grades and rules. Specifications and grades of Redwood have been established by California Redwood Association, Ponderosa and other species of pine by Standard Grading Rules published by the Western Pine Association.

MORE BY-PRODUCTS FROM LUMBER

• Through a freak accident in 1915, Guy J. Bailey, pictured above, discovered a base from a wood by-product which would remove boiler scale. Out of his discovery has come Borgana, manufactured by the Chemical Division of the Portland Shingle Company, for use in preventing scale, rust and corrosion in boilers and pipes, and for helping to eliminate oil trouble. Here Mr. Bailey is shown examining "raw material," which previously was burned in sawdust mill incinerators.

Estimated Annual Consumption of Chemicals in Pulp Manufacture in Tons Per Year

Estimated by Chemical Market Research Groups

	Oregon, and Clark and Cowlitz Counties in Washington	Puget Sound Area	Total
Sulfur (other areas)	75,000	110,000	185,000
Limestone (local)	100,000	100,000	200,000
Lime (local)	35,000	20,000	55,000
Salt cake (California)	40,000	20,000	60,000
Soda ash (California)	5,000	3,500	8,500
Caustic soda (local)	3,500	25,000	28,500
Chlorine (local)	12,500	40,000	52,500

Approximate Annual Consumption of Chemicals in Paper Industry

	Oregon, and Clark and Cowlitz Counties in Washington	Puget Sound Area	Total
Rosin (other areas)	4,000	2,800	6,800
Alum (local)	10,000	7,000	17,000
Clay (other areas)	25,000		
Titanium pigments (other areas)	1,500	7,000	33,500
Talc (local)	3,500	Not Reported	
Sodium Silicate (local)	3,500	" "	
Starch (other areas)	6,000	" "	
Soy Bean (other areas)	500	" "	
Sulphuric Acid (local)	500	" "	
Sodium Aluminate (other areas)	Minor Quantity	Not Reported	
Enzymes (other areas)	" "	" "	
Dyestuffs (other areas)	$600,000	" "	

PLYWOOD . . . Centered in the West

NO particularly significant developments in the Western plywood industry are foreseen for 1950. There have been heavy increases in production capacity in the last few years, but market demand has kept well apace. Greater capacity has of course put additional strains on raw material supply, which is to say the larger size, high grade, Douglas fir logs known as "peelers."

There is an ultimate limit to the supply of old growth peelers. The effect so far has been to shift the center of production southward into Oregon and northern California to remaining stands of virgin timber.

Looking forward on this question of log supply, the industry continues to experiment in laboratory and plant on other species, principally Western hemlock and white fir. While logs of these other species can be purchased at much lower prices, processing of these woods other than Douglas fir has developed a number of rather troublesome production problems and these, thus far, have served to offset any advantage in cheaper raw material.

Some work has been done in the application of plastics and other materials other than native wood to the exterior surfaces of plywood. There was some over-emphasis in this sphere during the war. In the long run, the application of synthetic surfaces seems to hold good prospect, offering a wider variety of product plus possible production economies and greater utilization of raw material. However, at present the production of these special grades is not large, but such as there is now has firmer marketing behind it.

Plants built in the future will probably be smaller. Prewar plants were built to about 6 million square feet capacity, but new plants are more likely to be from 3 to 4 million. This results from the fact that today's much higher costs will simply buy much less plant and equipment. Operators see no particular advantage in integrating plywood plants with other wood-using industries, except to give some added assurance to raw material supply. Plants are quite likely to be fairly well scattered, and not too large, with location determined largely by proximity to adequate timber.

PLYWOOD ADHESIVES

Prepared by Puget Sound Chemical Market Research Groups

Production in Puget Sound Area

	Millions of Pounds		
	1947	1948	1949
Phenolic Resin (40-50% solids)	35.0	37.6	29.4
Soybean	24.7	30.3	30.5
Casein	5.3	5.0	4.7
Other (Urea, Resorcinol, etc.)	2.0	3.0	2.8

Note: Oregon Chemical Market Research Group estimates producers of phenolic adhesives in Portland area consume approximately 2,500,000 pounds of formalin (37% formaldehyde) per year, about 1,500,000 pounds of phenol and 2,000,000 pounds of miscellaneous fillers, such as walnut shell flour, wood flour, bark products and other extenders. Plywood industry consumes 11,250,000 pounds of phenolic resin and 44,000,000 pounds of soybean base and similar adhesives. Also that furniture industry in Portland consumes about 400,000 pounds of urea per year.

MATERIALS USED FOR PLYWOOD ADHESIVES MANUFACTURE
SAME AREA

Material	1947 Thousands of lbs.			1948 Thousands of lbs.			1949 Thousands of lbs.		
	AM	PM	Total	AM	PM	Total	AM	PM	Total
Phenol	8,400	.....	8,400	9,000	.....	9,000	7,300	.....	7,300
Formaldehyde, 37%	17,300	.....	17,300	19,600	.....	19,600	16,100	.....	16,100
Caustic Soda, 100%	2,300	920	3,220	2,400	1,120	3,520	1,900	1,130	3,030
Sodium Carbonate	250	.....	250	300	.....	300	300	.....	300
Phosphates	250	.....	250	300	.....	300	400	.....	400
Sodium Fluoride	500	.....	500	600	.....	600	600	.....	600
Urea	1,000	.....	1,000	1,400	.....	1,400	1,200	.....	1,200
Resorcinol	40	.....	40	60	.....	60	50	.....	50
Lime	790	1,600	2,390	740	1,900	2,640	750	1,900	2,650
Sodium Silicate	.....	3,300	3,300	.....	4,000	4,000	.....	4,100	4,100
Carbon Disulfide	.....	200	200	.....	240	240	.....	240	240
Carbon Tetrachloride	.....	63	63	.....	80	80	.....	80	80
Paraformaldehyde	20	.....	20	30	.....	30	25	.....	25
Soya Flour	22,300	.....	22,300	27,400	.....	27,400	27,400	.....	27,400
Casein	3,300	.....	3,300	3,000	.....	3,000	2,800	.....	2,800
Blood	1,300	.....	1,300	1,400	.....	1,400	1,100	.....	1,100
Walnut Shell Flour	750	2,200	2,950	840	2,500	3,340	640	2,200	2,840
Bark Flour	.....	100	100	.....	150	150	.....	200	200
Wheat Flour	.....	800	800	.....	1,200	1,200	.....	1,100	1,100
Pine Oil	500	.....	500	600	.....	600	700	.....	700

AM—Adhesive Manufacturers PM—Plywood Mills

Plywood Plants

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with 1-19 employees	20-99 employees	100 employees and over	All employees Number (average for year)	Salaries & wages, total	Production workers Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Washington	21	.....	2	19	6,508	$23,724	4,399	6,039	$21,061	$48,347	$2,275
Oregon	13	.....	3	10	3,561	12,406	1,069	3,287	11,275	31,091	1,541
California	8	3	4	1	414	1,182	**	369	1,026	2,745	283
Total Pacific	42	3	9	30	10,483	37,312	.....	9,695	33,362	82,183	4,099

** Withheld to avoid disclosing figures for individual companies.

Want to Save Operating Costs? Materials Handling Does It

By GEORGE A. McDONALD
Instructor, Transportation Technologies
Los Angeles Harbor Junior College

WAR time operations saw the increasing development and enlargement of the field of materials handling. Now over four years have passed since the cessation of hostilities and during this time the science of materials handling has not been idle. True, the nation is in the midst of a difficult problem of postwar adjustment, a period when operating costs must be trimmed to meet the demands of competition.

Materials handling is in a position to aid in the lowering of costs in production and distribution. Few new plants are being constructed without the assistance of qualified engineers who are prepared to lay out the plant to utilize modern materials handling facilities.

Although development work of this nature is strongly pursued in the East, Western users are more eager to use improved devices in order to offset the higher (Western) labor costs and remain in competitive position.

Modernization

Modernization of a plant does not necessarily imply the installation of materials handling for the first time. Often existing materials handling equipment is replaced by new improved types.

An illustration of this point may be found in the fishing industry of Terminal Island in Los Angeles Harbor. Until recently the fishing boats were unloaded at the processing plants by a simple, but costly, method. Shoreside cranes were used to lower buckets into the fishing vessel hold. These buckets were loaded and hoisted back to pier level. The buckets, in reality wheeled carts, were then disconnected from the crane tackle and two men were required to push the carts across the congested pier apron and into the processing plant.

This slow and wasteful method has been almost eliminated by the use of conveyors. Wide endless belt conveyors have been installed to carry the ocean catch from the side of the vessel directly into the processing plant.

These conveyors, whose overall length averages 200 feet, extend from water level to the second story of the processing plant. The catch is lifted by the fishing vessel gear onto scoops which direct the fish onto the conveyor belt which then carries the fish into the plant.

Many advantages are achieved by this method. The fish enter the plant at an elevated position which lends itself to better plant layout and the use of gravity conveyors. They enter the processing plant in an even steady flow. The old method of pushing the loaded carts across a busy roadway is eliminated and the need for expensive manpower to push the carts is no longer necessary. The time consumed in the unloading process is lessened.

However, the use of the conveyor system does not lend itself to the handling of large fish such as tuna. The bucket system is still used but an improved type of fast, smooth-acting electric crane facilitates the operation.

There is a strong movement to develop a uniformity of pallet size. It does not require a crystal ball to predict that the time is approaching when pallets will be exchanged by shippers and carriers in order that unit loads may remain unbroken from the producer's plant to the consignee. The loading of pallets is still the slowest and most costly phase of unitized operation.

GEORGE A. McDONALD

Manufacturing processes have become so fast, and conveyor systems have been so well developed that manufactured items or packages of them are sent down the conveyor lines faster than humans can palletize them. So now it's done automatically. Conveyor lines feed into an automatic palletizer, and the loaded pallets come out the other side. A fork lift picks them up and warehouses them. Such a palletizer is installed by Lamson Conveyor Co., Syracuse, N. Y., at Wieland's Brewery, San Jose, Calif., to distinct advantage of the brewery. Three conveyor lines feed different size cases into this palletizer; an electronic brain does all the "thinking," and pallet loads are rapidly formed of each size case.

1 Man Equals 10

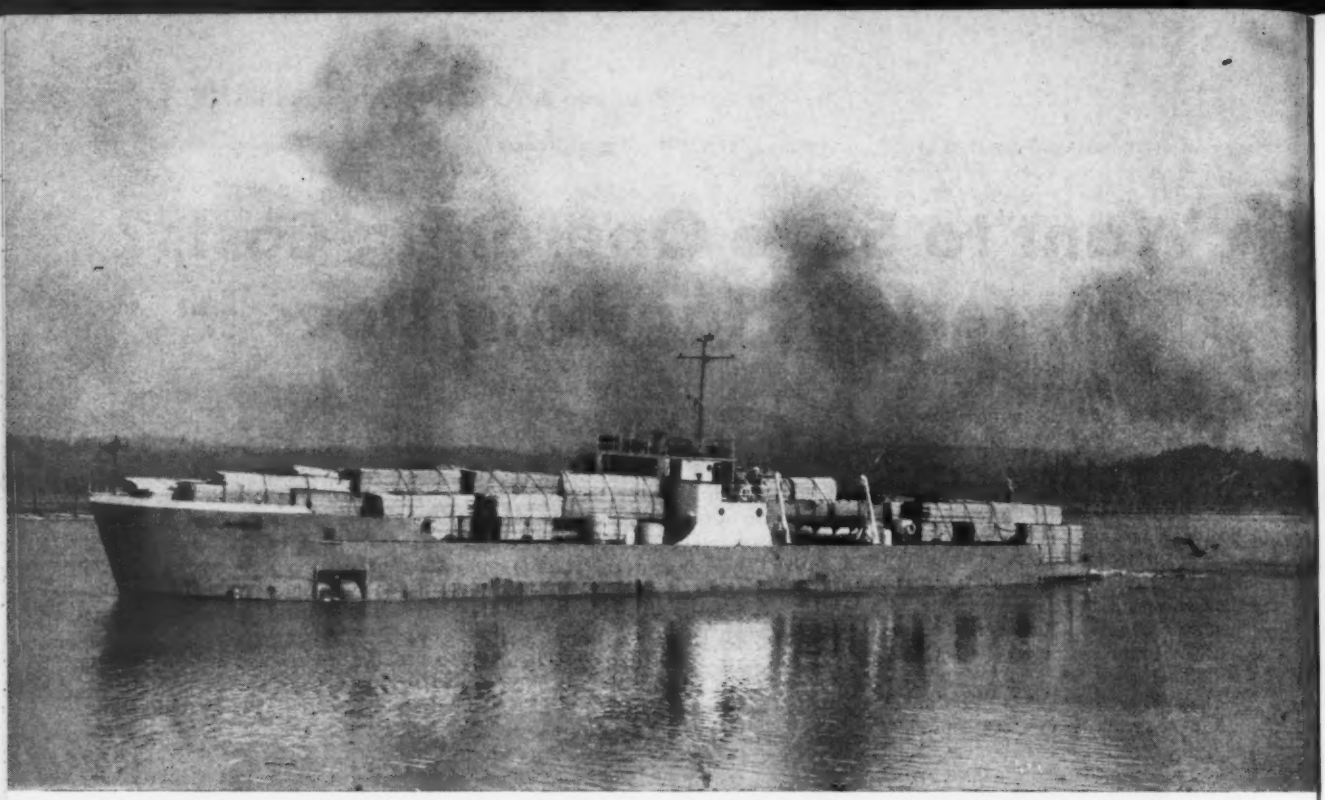
This machine is adaptable to the handling of uniformly packaged products. One man operating the machine can do the work previously done by 10 or more workers in some plants.

Disposable paper pallets appeared in San Francisco, as part of shipments of drugs and pharmaceuticals from New York. These pallets, made in Boston, were first used by Bristol & Myers Co. They are now incorporated as standard shipping practice with them.

Such pallets are made of paper, cost around a dollar each or less, and will support weight comparable to wooden pallets in general use. Goods are piled on paper pallets at the factory, and the pallets ride with the same goods upon them all the way to shipping destination. When the goods are eventually removed (after warehousing and reshipping) the pallets are then thrown away or burned. Great savings in transportation costs are effected.

A comprehensive discussion of paper pallets appeared in WESTERN INDUSTRY for April; since that time, both manufacturers and shippers have awakened to the possibilities in these lightweight units, and Western firms are now furnishing them. There has been some discussion by Western industrialists toward adjusting the freight classi-

(Continued on next page)



• Rolando under way, with 650,000 ft. of sized lumber enroute to California from Oregon mill. She has made seven round trips in 30 days. Each package unit of lumber has 2,500-3,000 feet bound on each end with half-inch galvanized wire. Bundles, 20 feet or longer, are provided with two steel cable slings; those under 20 feet have one sling. Dockside cranes load and unload.

fication and rate structure to accommodate palletized merchandise.

Ocean Carriers

The ocean carriers of lumber are also undergoing a change. There are special type vessels which carry this packaged lumber. The converted navy landing craft "Rolando" typifies this trend. There is no cargo handling gear aboard the vessel. The lumber is loaded and unloaded by means of flexible crawler cranes which speedily handle the packaged unit loads of lumber. With a capacity of over 600,000 board feet the vessel can be loaded in ten hours and unloaded in even less time. Other such vessels are in operation and more are contemplated.

Unit loads imply less cargo handling and this results in lower costs, greater efficiency, and less damage and pilferage to the contents. Western ship operators such as the Matson Navigation Company are using durable plywood containers. These containers, approximately five feet square and seven feet high, are especially valuable in the handling of small packages and valuable commodities. Resting on skids, the units can be readily moved by fork lift trucks and hoisted aboard ship by means of lifting rings which are built into the upper corners of the containers.

The use of these containers has rendered pilferage negligible and has prevented damage by crushing or shifting of cargo. At the point of origin the goods are stowed in the container and the access door is sealed; it is not opened until arrival at the destination.

This is a vast improvement over the old method requiring expensive export packaging and numerous individual handlings of each item. In the eastern part of the country where similar containers have been used extensively, these containers are often used for the entire journey traveling over the land portion via truck or rail carrier.

Lumber Industry

Much progress may be noted in the lumber industry. Here, the science of materials handling has lowered costs of handling and speeded operation. Most noteworthy is the increasing use of packaged units of lumber. This lumber is strapped into units of uniform length and convenient weight at the mill. Thus, a unit load is achieved, and modern materials handling methods can be used.

Large yard-type fork lift trucks or straddle trucks are used to stack these units for storage or transport them to rail or water carriers. One man operating a fork lift or straddle truck can do the work done by many men using the old piece by piece method. These packaged units of lumber can remain securely bound until they reach their destination where materials handling equipment can be used to expedite the unloading process. In a matter of hours the work of days of manual labor can be accomplished.

Grain elevators become more mechanized. Loading and discharging became automatic with development of the Delivuk automatic distributor.

Heavy Industry

Heavy industry in at least one phase brought out new uses for pneumatically-operated equipment. One, developed by Berger Engineering Co., Seattle, is a device to attach to a standard make steam, gasoline or diesel shovel. With this unit (it replaces the shovel's bucket) and an air compressor to supply it, huge logs in the woods can be handled easily and rapidly. Much labor is saved and the operation is considerably safer.

Another removable attachment for heavy industry is hydraulically-operated. Marine Terminals Corp., San Francisco, developed a unit that replaces the forks on a lift truck in 20 minutes. With this new device, one or two full rolls of newsprint (or bales of material, drums, etc.) can be handled easily. It will pick up such materials lying on the floor and stack them vertically as many as five high. Hence, the fork lift now has two uses for the same machine; warehouse space is now more fully usable; goods handled are damaged far less, and persons handling or nearby during handling operations are far safer.

A new wrinkle in conveyor systems was developed during 1948 and proved itself in over a year's operation. This is an all-electric, all-automatic installa-

tion, first of its kind. All parts for it were purchased on the open market, but it took the treasurer of a merchandising firm (Sherwood Swan, Ltd., Oakland, Calif.) to design and put it together. Package handling costs were thereby reduced from 8.4c each to 1.8c each, and a new era began for conveyor sales and uses.

June WESTERN INDUSTRY carried a complete and comprehensive account of this new use.

Bulk Handling

Bulk unloading of materials has been developed to a high state by two firms: Permanente Cement Co., and Stephens-Adamson Mfg. Co. Permanente Cement has two ships on the "cement run" now, both loaded and unloaded of bulk cement by pneumatic systems, through tubes.

And Stephens-Adamson has developed a box car unloader that automatically scoop unloads and sweeps cars in one-half man hour or less, with only one man handling all operations from outside the car.

Enlightened labor leaders recognize the need for economy in production costs, and the use of modern materials handling methods is providing an impetus to increased productive effort. True, some equipment displaces manpower which is not immediately reemployed in the productive effort. However, it is elementary economics that a healthy industry is more desirable than no industry at all.

About the Future

There is no fixed rule or set of rules which can be applied to the modernization or application of materials handling equipment. Each specific operation is unique and requires careful study and investigation. It is here that the qualified engineer is necessary to investigate the existing methods and to anlyze the situation in order to apply the best possible improved type of materials handling equipment.

The future and what it holds may best be judged by the current trends. New industries and branches of eastern industries are being constructed in the Western states. Shipping is on the upswing. All of the West Coast ports are improving facilities and expanding their operations. New open-span transit sheds offering free movement of materials handling equipment are being constructed. Nearly all of the ports report increases in tonnage over past postwar years and already some ports have exceeded their prewar tonnages. The relatively new Port of Stockton, California, reports that the calendar year 1949 will record the highest tonnages handled by that port to date.

The future of the West is healthy and prosperous. Industry is expanding, shipping is increasing, and we can look toward an unlimited future. Hand in hand with this progress goes ever greater efficiency in materials handling. The application of the right equipment to do a particular job is the duty of the plant superintendent and the materials handling engineer. Each industry, be it productive or distributive, can benefit by the application of modern materials handling techniques.

Progress on the March

Only a few new developments have been listed, countless others have been developed or are in the process of development. Through greater efficiency, lower costs, and wider application, the science of materials handling is providing a vital and necessary function to a cost-conscious and progressive Western industry.

• This boxcar unloader, developed by Stephens-Adamson engineers, is one of year's latest bulk handling innovations. One man handles all operations from outside car door, and automatic power scoop unloads and sweeps the car clean in one-half man hour or less. It is full or semi-automatic, and cleans floor as shown with only one pass of the brush over the floor.

AIRCRAFT . . . Greatest concentration is in California

ESTIMATED ANNUAL USE IN 1949 OF CHEMICALS USED IN AVIATION INDUSTRY IN SOUTHERN CALIFORNIA

Prepared for Chemical Market Research Group of Southern California by Paul R. Pariseau, Pacific Chemical Company, Division of American-Marietta Company

G represents Gallons
T represents Tons

CHEMICALS AND COMPOUNDS	GROUP 1 Aircraft Manufacture	GROUP 2 Aircraft Maintenance by Operating & Servicing Companies	GROUP 3 Aircraft Maintenance by Military	Total Groups 1, 2 & 3
Hydraulic Oil	25,000 G	22,000 G	30,000 G	77,000 G
De-Icing Alcohol*	4,000 G	39,000 G	7,000 G	50,000 G
Emulsion Cleaner*	1,500 G	69,000 G	300,000 G	370,500 G
Petroleum Solvents	600,000 G	470,000 G	1,200,000 G	2,270,000 G
Deodorizers	.....	3,000 G	.....	3,000 G
Supercharger Oil	.....	27,000 G	.....	27,000 G
Paint Remover*	3,000 G	93,000 G	60,000 G	156,000 G
Carbon Remover*	1,000 G	23,000 G	20,000 G	44,000 G
Alkaline Cleaners*	200 T	19 T	180 T	399 T
Caustic Cleaners*	90 T	.....	.....	90 T
Degreasing Chlorinated Solvent	1,200 T	.....	250 T	1,450 T
Pre Spotweld Etch*	70 T	.....	.....	70 T
Chromic Acid	300 T	.....	65 T	365 T
Other Acids	95 T	.....	50 T	145 T
Plating Chemicals	65 T	.....	80 T	145 T
Fuel Cell Sealants	50 T	16 T	.....	66 T
Adhesives	6,000 G	700 G	.....	6,700 G
Paint Booth Treatments*	65 T	.....	.....	65 T
Paints:				
Zinc Chromate	85,000 G	.....	.....	85,000 G
Lacquers & Enamels	63,000 G	17,000 G	170,000 G	250,000 G
Thinners	275,000 G	37,000 G	180,000 G	492,000 G
Boiler Treatment*	30 T	.....	.....	30 T
Janitorial Supplies:				
Hand Soap*	175 T	26 T	25 T	226 T
Floor Sweep	50 T	125 T	200 T	375 T
Dishwash'g Compounds*	200 T	.....	.....	200 T
Carbon Dioxide	1,500 T	.....	250 T	1,750 T
Photographic	250 T	.....	.....	250 T
TOTALS:				
Tons listed	4,340 T	186 T	1,100 T	5,626 T
Gallons listed	1,063,500 G	800,700 G	1,967,000 G	3,831,200 G
Total Tons (using 7#/gal. for liquids)	8,062 T	2,988 T	7,984 T	19,034 T

Basic Chemicals Used in Compound Products Marked * in Above Estimated From Approximate Composition Are Shown Below:

	Tons		Tons
Alcohols (Isopropyl, methanol and denatured)	262	Emulsifying & wetting agents ②	150
Tall oil	560	Sodium Metasilicate	207
Potassium hydroxide	112	Tetra sodium pyro phosphate and complex phosphates	175
Coupling solvents ①	210	Soda ash	160
Methylene chloride	350	Sodium bicarbonate	32
Other chlorinated solvents	75	Tri sodium phosphate	70
Cresylic acid	78	Sodium hydroxide	180
Paraffine wax	15	Phosphoric acid	48
Ammonia 26° B	70	Sodium silicate	3
Methyl Cellulose	10	Oleic acid	22
Casein derivatives	15	Tallow and stearic acid	35
Monoethylamine & Triethanolamine	20	Borax	47

① Coupling solvents includes Cellosolve, Dowonals and pine oil.
② Emulsifying and wetting agents includes synthetic ionic type materials such as alkyl aryl sulfonates, as well as non-ionic type synthetics.

A STRONG trend toward use in aircraft of materials of greater yield and tensile strength developed this year, with growing emphasis on heat treatment and use of a good deal of hard alloy 75ST6. Fabrication of the stiffer alloys in turn has called for bigger machine tools and presses.

Reason for the trend is enormously increased stresses in advanced military planes, which are bigger, heavier, and fly at speeds running into the supersonic range.

Fighter plane speeds have been boosted 200 miles per hour since the close of the war. The new B-47, termed a "medium bomber," weighs 97 tons, whereas the B-17, workhorse of the last war, was called a "heavy" bomber but weighed only 32 tons.

Aircraft power plants meanwhile have grown correspondingly. The B-47's six jet engines develop 50,000 horsepower—ten times the power of a B-17, or enough to drive a 25,000-ton battleship.

Last Year's Dilemma

Last year the industry grappled with this dilemma: Airframes must be strong enough to withstand the incredible strains of flight; yet to reach these speeds, wings must be "sculptured" to mathematically precise, complex shapes prescribed by wind tunnel research.

Tolerances must be much smaller to reach the necessary efficiency. Old methods of laboriously shaping a wing by riveting an aluminum skin over a sectional frame are too clumsy and slow, creating hopeless bottlenecks.

Sculpturing has been carried to the point where in modern "swept-back" fighters, for instance, wing edges must be too thin along the edges to depend on internal stiffening.

The taper must be carried out by use of material strong enough to be largely self-supporting. A wing skin that is ¾-inch thick where it joins the fuselage must be perhaps less than 1/16-inch at the wingtip.

This year the industry has experimented with two solutions: (1) to start

AIRCRAFT EQUIPMENT (not elsewhere classified)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers			Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
California	104	61	29	14	8,400	$27,902	***	6,327	$19,165	$42,303	$1,800
Aircraft Engines											
California	13	7	2	4	1,809	$6,405	* *	1,259	$4,231	$11,185	$548

** Withheld to avoid disclosing figures for individual companies.
*** Not available.

with heavy sheet and machine it down to the required taper, and (2) to attempt to roll tapered aluminum sheets, thick at one edge, thin at the other.

North American Aviation has developed a milling process (described recently in *Western Industry*) which turns out wing spars in a single piece, shaped to a designated pattern.

Aluminum Corporation of America meanwhile has experimented at its Alcoa, Tennessee, plant with a method of rolling sheet to the required taper. Thus far it has succeeded in producing a sheet three times as thick along one end as on the other, in widths up to 48 inches.

Biggest Problem

Biggest problem is flattening the sheets after heat treatment but Alcoa reports encouraging progress. Sizeable quantities have been supplied to several major aircraft plants, which are using them with apparently satisfactory results.

Engineers believe the choice between the two methods may hinge upon relative costs. The large potential market for tapered sheet in the aircraft industry could result in considerable modification of the aluminum industry's rolling facilities to supply this material.

High-speed flight developments of the year also created difficult air conditioning problems. In a recent test, the temperature in the cockpit of a Douglas Skymaster flying at 620 m.p.h. at 100 feet above the ground, rose through air friction to 165 degrees in a matter of moments.

AiResearch has produced a unit about the size of a baseball, weighing 7 pounds, in which a mechanism turning at 100,000 r.p.m. develops a refrigerating capacity equal to 45 household refrigerators. Boiling water passing through emerges as snowflakes in an instant.

Few Other Techniques

Few other major production-line techniques developed during the past year, because few airplane makers had orders large enough to permit large-scale production methods.

Developmental work has gone forward to the extent permitted by reduced military budgets.

The switch in strategy to the B-36 virtually scrapped the Flying Wing program and held heavy jet bomber production to a rather limited basis. It called a halt on Northrop's research with its "Turbodyne" which was about ready for actual flight tests in a Flying Wing.

• This "Man from Mars" plane is an early design Northrop research model known as X-4. It was developed to test aerodynamic performance through sonic speed range.

The 10,000-h.p. engine is rated as the world's most powerful "prop-jet" power plant. The British meanwhile are proceeding with smaller prop-jets and are concentrating heavily on jets, bidding strongly for leadership, although U. S. makers have some 34 models in different stages of test or actual production, some of them secret but said to be at least equal to any foreign design.

New Wind Tunnels

Several new wind tunnels of unprecedented size were projected, including one just completed at California Institute of Technology for Army Ordnance, capable of creating air flow at speed of more than ten times the velocity of sound.

Such projects are basic to the large amount of guided missile research now well distributed in the industry.

Experts Say—

Experts say that despite considerable pilotless plane development, the era of "pushbutton warfare" still is perhaps a decade in the future.

Disclosure that Russia has effected an atomic explosion stimulated fears that military contracts might be shifted from U. S. coasts to the interior.

So far, however, the extent of such changes has been relatively small. Some new contracts have been placed in midwestern government-owned plants, reopened for the purpose in line with the military's well-known policy of dispersal of war industry.

FOOD PRODUCTS . . . West is headquarters for processed fruit

THE big production problem facing the canning industry is higher yield of processed foods per ton of raw material, in view of increasing costs and narrowing margin of profit.

A bold experiment in meeting this problem was made by the California peach canning industry in the 1949 season, when growers and canners agreed to raise the minimum diameter of fruit acceptable for canning from the previous mark of 2⅜ inches to 2.441 inches (62 millimetres). The intention was to force most of the pack into the fancy and choice grades, which are always the easiest to sell, and reduce the proportion of standards, pie and water grades, which usually are the drug on the market.

It is too early to tell how successful this experiment will prove, although the other purpose, of limiting the size of the pack, did not work out too well; the familiar story in the canning industry was repeated, of the pack being bigger than expected.

Improvements in pitting apricots and peaches and peeling fruits and vegetables are going on. Pitting of peaches by machines has been in vogue for upward of 15 years, but a new machine is being tried out by several canneries in California which is asserted to have the advantage of not jamming when split pits are encountered. Split pits are due largely to fruit sizing too rapidly.

Apricot pitters, which the canning industry recognizes must be perfected if apricots are to be canned at a profit, have been slow to develop, but several varieties are in more or less experimental use. One device brings the sutures of the fruit into position by revolving the apricots between devolving discs before the fruit meets the splitting and pitting knives.

A higher recovery per ton in the cases of potatoes, carrots and some other

FOOD AND KINDRED PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with 1-19 employees	20-99 employees	100 employees and over	All employees Number (average for year)	Salaries & wages, total	Production workers Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Montana	206	154	46	6	4,079	$10,283	2,361	3,212	$7,695	$26,230	$3,281
Idaho	244	170	65	9	6,020	14,951	2,786	4,944	11,572	43,653	7,473
Wyoming	78	63	11	4	1,379	3,426	974	1,053	2,477	7,834	592
Colorado	442	311	89	42	15,295	39,195	8,085	12,160	28,282	92,675	8,701
New Mexico	144	122	22	.....	1,706	3,497	717	1,289	2,334	7,898	1,196
Arizona	167	123	39	5	3,433	8,779	1,319	2,528	5,848	20,812	2,957
Utah	285	189	72	24	8,036	18,530	4,826	6,533	13,320	42,948	5,509
Nevada	40	23	17	.....	635	1,833	328	463	1,276	3,309	546
Total Mtn.	1,606	1,155	361	.....	40,583	100,494	21,396	32,182	72,774	245,359	30,255
Washington	752	471	213	68	26,144	69,270	13,779	21,396	52,040	148,904	15,988
Oregon	545	350	154	41	17,761	46,063	9,940	14,538	34,211	107,767	11,627
California	2,803	1,784	735	284	120,510	355,586	70,466	94,942	252,202	851,836	95,991
Total Pacific	4,100	2,605	1,102	394	164,415	470,919	94,185	130,876	338,453	1,108,507	123,606
Total West'rn	5,706	3,760	1,463	.....	204,998	571,413	115,581	163,058	411,227	1,353,866	153,861
Canning and Preserving (except fish)											
Montana	5	4	1	.....	106	$167	83	91	$124	$515	$29
Idaho	8	3	4	1	422	840	118	366	657	1,826	301
Colorado	18	8	8	2	771	1,104	561	745	995	2,100	316
Utah	35	11	18	6	1,786	3,227	1,685	1,650	2,668	6,320	683
Total Mtn.	66	26	31	9	3,085	5,338	2,447	2,852	4,444	10,761	1,329
Washington	52	18	12	22	5,321	11,517	3,146	4,885	10,091	23,633	2,570
Oregon	50	15	19	16	4,581	10,583	3,755	4,200	9,167	20,592	2,933
California	218	72	66	80	26,379	74,676	19,001	23,669	62,101	161,191	27,004
Total Pacific	320	105	97	118	36,281	96,776	25,902	32,754	81,359	205,416	32,507
Total West'rn	386	131	128	127	39,366	102,114	28,349	35,606	85,803	216,177	33,836
Canned Sea Food											
Washington	48	22	24	2	1,707	$3,867	799	1,596	$3,286	$9,891	$457
Oregon	19	7	7	5	1,296	2,646	605	1,201	2,343	6,656	424
California	54	11	20	23	8,136	18,510	5,558	7,695	15,816	52,724	2,816
Total Pacific	121	40	51	30	11,139	25,023	6,962	10,492	21,445	69,271	3,697
Cured Fish											
California	6	4	2	.....	150	$433	41	128	$344	$743	$27
Dehydrated Fruits and Vegetables											
California	87	59	26	2	1,701	$3,541	6,494	1,586	$3,078	$9,916	$351
Pickles and Sauces											
Colorado	16	13	2	1	371	$626	* *	342	$548	$1,047	$99
Washington	15	8	7	.....	340	719	110	317	639	1,835	206
Oregon	10	6	4	.....	239	534	125	223	438	904	121
California	90	67	17	6	2,950	8,287	967	2,539	6,908	22,969	2,359
Total Pacific	115	81	28	.....	3,529	9,540	1,202	3,079	7,985	25,708	2,686
Total West'rn	131	94	30	7	3,900	10,166	1,202	3,421	8,533	26,755	2,785

items has resulted from use of a peeling machine which lightly sprays the product with a caustic solution and then suddenly applies and shuts off steam pressure, causing a sort of explosive action.

The trend toward higher speeds in production lines continues. Last season also cooking of cream style corn in continuous pressure cookers and coolers was tried out in a couple of Pacific Northwest canneries and elsewhere in the country. This proved successful and promises to succeed the historic method of processing in retorts, as the new method is done at high temperature with a short cook, with resulting higher quality and vitamin retention. It involves several innovations in preparation of the corn, such as the use of special starch.

In fish canning an improved "iron chink" for salmon is being developed to clean and skin the fish, in addition to cutting it up, and then drop it into a hopper. It is still on an experimental basis. Considerable work is being done in sardine and tuna canneries in the way of in-plant sanitation and rodent control.

• Tremendous savings in time and space have been made possible in cannery warehouses by materials handling equipment. Scene at Filice & Perelli's, Richmond, Calif.

Frozen Foods

A MAJOR development in frozen foods processing is a sliding contact plate freezer, which throws open to the entire industry an opportunity to use the plate freezing method hitherto controlled by General Foods Corporation, who own the Birdseye process brought out about 20 years ago.

The Birdseye freezer is a stationary system, in which the cartons of food to be frozen are placed by hand between plates which impart the low temperature. At the end of the process the cartons are taken out by hand. Under the Food machinery automatic system, introduced in the 1948 season, the cartons are carried back and forth between a series of horizontal shelves through which the refrigerant is continuously pumped, a method which resembles somewhat the continuous cooker for canned foods in that the containers are fed into one end and emerge from the other end completely processed.

Improvements in preparation of fruits and vegetables for freezing are going on continually. One item is an automatic cutter driven by water power

FOOD PRODUCTS—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Frozen Foods											
Colorado	7	5	2	.....	168	$232	*	*	159	$192	$600	$39
Washington	42	13	20	9	2,399	4,895	624		2,190	4,047	10,200	1,327
California	37	13	18	6	2,004	4,241	164		1,799	3,396	7,153	1,612
Total Pacific	79	26	38	15	4,403	9,136	788		3,989	7,443	17,353	2,939
Total West'rn	86	31	40	15	4,571	9,368	788		4,148	7,635	17,953	2,978
Flavorings											
Washington	8	6	1	1	294	$911	23		153	$362	$1,654	$60
California	57	42	12	3	1,870	5,512	527		1,101	3,174	14,776	1,199
Total Pacific	65	48	13	4	2,164	6,423	550		1,254	3,536	16,430	1,259
Vinegar and Cider											
California	9	8	1	.....	101	$232	67		86	$202	$531	$31
Miscellaneous Food Preparations											
Colorado	65	49	15	1	1,052	$2,423	370		770	$1,502	$4,504	$425
Arizona	38	28	9	1	938	2,343	187		642	1,537	4,954	971
Utah	24	21	3	.....	295	672	103		214	431	1,287	73
Total Mtn.	127	106	17	4	2,347	6,090	694		1,640	4,078	15,702	1,964
California	534	382	118	34	13,403	39,430	4,392		8,644	22,717	113,859	8,559
Total West'rn	661	488	135	38	15,750	45,520	5,086		10,284	26,795	129,561	10,523

FOOD PRODUCTS

(Continued from page 59)

which cuts off the butt from Brussels sprouts, reducing considerably the amount of hand labor required.

Another is a walking beam system of moving packaged food through a long tunnel while it is subjected to sprays of steam or hot or cold water. The containers travel along a metal channel in which metal slats rise up at regular intervals to walk the containers through.

Automatic methods of filling containers are increasing. Peas are easy to handle, but broccoli and cauliflower, where the danger of breakage is a serious matter, present difficult problems. Apparently there is a strong tendency to do away with transparent liners and bags inside the paperboard containers, in order to save on costs of materials and labor.

For several years there has been a trend toward packing 36 containers in a carton, but there is also a countercurrent in favor of 12 packages to avoid the cost of breaking the carton for small orders.

Package design and labeling has undergone great improvement, due very likely to the fact that competition is becoming increasingly keen. It is now becoming obvious that consumers are only slightly interested in polar bears, igloos, Eskimos, icebergs, and other symbols of chilliness, and are primarily concerned whether there is something good to eat inside the package. Consequently packages now have sales appeal as the primary consideration as far as appearance goes.

Sugar

CONSIDERABLE development in bulk handling of sugar has been achieved in the last year in plants in the West. Use of tote bins for bulk deliveries to canneries and other large users is an outstanding example. The totes, holding 2,500 lbs., are examples. Twenty totes on a flatbed truck and trailer will carry some 40,000 lbs. of sugar, at a saving of 15c per cwt. over paper bags.

Use of liquid sugar increased probably 35 per cent, with a similar increase looked for this coming season.

Spreckels Sugar Company, who packaged cane sugar in 1-lb. cartons before they sold their cane operation to California & Hawaiian Sugar Refining Company, have now set up packaging operations for beet sugar. Utah-Idaho Sugar Co. also has gone into powdered sugar in packages, and Great Western Sugar Co. of Denver are also in the carton game.

• This tank is a liquid sugar melter in use by Spreckels Sugar Company at their Salinas, California, refining plant.

Continuous diffusion battery systems for processing sugar are on the increase, with the Morton unit, manufactured by Oliver United Filters of Oakland, now being sold in competition with the Silver machine of Denver.

Bulk handling of Hawaiian raw sugar has now increased to about 45 per cent of total production, as the result of completion in 1949 of a bulk handling plant on the island of Hawaii. When a plant is completed on Kauai it will be possible to ship about 60 per cent of all Hawaiian output in bulk form.

The method is to store the raw sugar in steel silos, and to withdraw it by clamshell buckets which drop the sugar down a sectional discharge tube extending down through the center of each silo. At the base of the tube is a conveyor leading to the ship which carries the sugar to the California and Hawaiian Sugar Refinery at Crockett, Calif., where a reverse operation is performed.

FOOD PRODUCTS—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Meat Products											
Montana	21	12	8	1	677	$1,609	263	567	$1,222	$3,215	$231
Idaho	32	25	7	.....	410	1,141	186	332	831	2,447	423
Colorado	46	29	9	8	3,597	10,923	1,511	2,971	8,108	18,080	1,932
New Mexico	11	7	4	.....	265	566	93	211	397	1,334	249
Arizona	21	14	6	1	564	1,397	324	475	1,092	2,105	113
Utah	46	28	16	2	1,261	2,624	434	1,080	2,113	5,324	827
Nevada	8	6	2	.....	114	388	95	101	317	840	60
Total Mtn.	185	121	52	12	6,888	18,648	2,906	5,737	14,080	33,345	3,835
Washington	104	69	30	5	3,348	9,632	1,406	2,718	7,590	17,421	1,257
Oregon	56	30	24	2	1,926	5,310	882	1,511	3,656	8,994	1,065
California	275	153	101	21	13,617	43,976	6,183	10,680	32,099	69,690	6,898
Total Pacific	435	252	155	28	18,891	58,918	8,471	14,909	43,345	96,105	9,220
Total West'rn	620	373	207	40	25,779	77,566	11,377	20,646	57,425	129,450	13,055
Sugar											
California	12	.....	1	11	5,633	$16,392	3,916	5,051	$14,003	$33,018	$2,180
Beet Sugar											
Montana	5	.....	.....	5	944	$2,649	732	821	$2,231	$8,668	$1,661
Colorado	17	.....	1	16	3,012	7,997	1,730	2,516	6,536	28,252	2,829
Utah	5	.....	.....	5	725	2,159	796	638	1,869	5,621	1,365
Total Mtn.	27	.....	1	26	4,681	12,805	3,258	3,975	10,636	42,541	5,855
California	10	.....	1	9	2,788	7,703	* *	2,506	6,648	21,410	1,346
Total West'rn	37	.....	2	35	7,469	20,508	3,258	6,481	17,284	63,951	7,201

FOOD PRODUCTS

FLOUR production is rising to keep pace with the West's continuing population and industrial expansions. As in most other industries, mechanization and improved materials handling methods and equipment are prevalent.

Notable among Western advances during 1949 is a new bulk handling method known as "Tote box." This was originally developed at Fisher Bros. flour mill in Seattle, when Frank White, superintendent, realized a need for improving mill - to - consumer handling methods.

Today these boxes are designed 3½ feet by 4 feet by 5 feet 9 inches high, made of aluminum alloy, with no sharp corners and hermetic sealing provision. They weigh 225 pounds, are filled at the top and emptied at the bottom, after tipping. They will hold about 3,000 pounds of flour and provide near-perfect sanitation.

Bakeries that use the tote box system like it. Millers that fill the boxes like the system too, but somewhat less.

At the mill, for instance, flour for these boxes must be stored in bulk (it is generally stored in sacks). Otherwise, when a tote box comes in for filling, sacks must be broken open to fill it. Millers would like to have tote boxes come in for filling at the time the mill is running the specific grade of product

GRAIN MILL PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with				All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Montana	23	12	11	.....	511	$1,527	305	399	$1,248	$4,251	$271
Idaho	32	20	12	.....	526	1,440	204	419	1,074	4,227	291
Colorado	76	56	19	1	1,412	3,927	793	1,139	2,851	11,858	771
Arizona	19	11	8	.....	466	1,295	94	364	875	3,179	217
Utah	45	39	4	2	738	2,220	376	526	1,541	5,816	410
Total Mtn.	195	138	54	3	3,653	10,409	1,772	2,847	7,589	29,331	1,960
Washington	70	50	15	5	2,366	8,091	1,290	1,785	6,037	21,183	1,587
Oregon	73	51	18	4	1,789	5,721	925	1,350	4,132	16,692	1,299
California	252	173	65	14	6,536	19,884	2,362	4,831	13,696	58,132	5,642
Total Pacific	395	274	98	23	10,691	33,696	4,577	7,966	23,865	96,007	8,528
Total West'rn	590	412	152	26	14,344	44,105	6,349	10,813	31,454	125,338	10,488
Flour and Meal											
Montana	13	5	8	.....	415	$1,328	255	319	$1,035	$3,848	$224
Idaho	13	4	9	.....	331	958	158	260	714	2,903	129
Utah	21	18	1	2	491	1,615	266	318	1,053	4,296	278
Total Mtn.	66	38	26	2	1,703	5,196	773	1,261	3,677	14,226	848
Washington	17	6	7	4	1,575	5,887	850	1,150	4,340	16,253	1,209
Oregon	17	7	7	3	895	3,192	557	673	2,347	11,674	450
California	13	7	2	4	887	2,914	504	671	2,172	7,948	757
Total Pacific	47	20	16	11	3,357	11,993	1,911	2,494	8,859	35,875	2,416
Total West'rn	113	58	42	13	5,060	17,099	2,684	3,755	12,536	50,101	3,264
Prepared Animal Feeds											
California	205	143	53	9	4,828	$14,424	1,547	3,512	$9,719	$37,711	$3,767
Total Pacific	205	143	53	9	4,828	14,424	1,547	3,512	9,719	37,711	3,767
Rice Cleaning and Polishing											
California	10	4	5	1	444	$1,556	179	361	$1,127	$8,971	$605
Bakery Products											
Colorado	75	47	20	8	2,842	$6,918	1,685	2,034	$4,085	$12,255	$714
Washington	131	81	38	12	4,039	11,464	2,715	2,821	7,214	19,402	1,192
Oregon	87	48	36	3	2,574	7,859	1,407	1,745	4,558	13,484	1,325
California	403	259	108	36	16,547	55,957	11,455	11,295	31,648	104,136	9,314
Total Pacific	621	388	182	51	23,160	75,280	15,577	15,861	43,240	137,022	11,831
Total West'rn	696	435	202	59	26,002	82,198	17,262	17,895	47,505	149,277	12,545
Bread and Other Bakery Products											
Montana	44	29	15	.....	686	$1,538	483	514	$1,055	$3,356	$172
Idaho	34	24	10	.....	586	1,413	370	400	886	2,785	217
Wyoming	29	25	4	.....	288	592	201	226	426	1,128	124
Colorado	75	47	20	8	2,842	6,918	1,685	2,034	4,085	12,255	714
New Mexico	42	35	7	.....	487	1,086	308	373	727	2,156	256
Arizona	30	21	7	2	664	1,826	427	468	1,107	3,787	814
Utah	32	21	6	5	1,081	2,767	588	796	1,674	5,210	554
Nevada	8	4	4	.....	137	370	74	94	268	603	19
Total Mtn.	294	206	73	.....	6,771	16,510	4,136	4,905	10,228	30,280	2,870
Washington	131	81	38	12	4,039	11,464	2,715	2,821	7,214	19,402	1,192
Oregon	87	48	36	3	2,574	7,859	1,407	1,745	4,558	13,484	1,325
California	384	253	101	30	13,668	48,720	10,054	8,813	27,468	85,630	7,127
Total Pacific	602	382	175	45	20,281	68,043	14,176	13,379	39,240	118,516	9,644
Total West'rn	896	588	248	.....	27,052	84,553	18,312	18,284	49,468	148,796	22,158
Biscuits, Crackers and Pretzels											
Washington	9	2	3	4	700	$1,613	443	563	$1,097	$3,565	$171
California	19	6	7	6	2,879	7,234	1,401	2,482	5,349	18,506	2,187
Total Pacific	28	8	10	10	29,409	8,847	1,844	3,045	6,446	22,071	2,358
Macaroni and Spaghetti											
California	38	26	11	1	689	$1,728	418	566	$1,228	$3,597	$343

required. Such a desirable meeting is rarely effected.

In local or short-haul areas, this system works out well. But for long distances, it is not too economical for bakers. The empty box must be returned to the mill for a refill, and freight on an empty container is not a productive expense.

Uses for tote boxes have been developed from the flour milling business, however, and this system may prove to be one of the year's high points in bulk handling improvements.

Mills, too, made distinct advances in production methods this year. General Mills' new plant in Los Angeles is the main case at point. In it are found features never before attempted in flour milling.

Included are pneumatic conveying systems, radical changes in building and elevator construction, and an almost completely automatic control system.

• Aluminum tote boxes, designed to hold 3000 pounds of flour, and with bottoms acting as built-in pallet, step up the handling problem in several bakeries.

One feature of particular interest is the use of inert gas in the elevators. As grain is removed, a pressure control system detects it and diverts inert gas into the bin to displace it.

A three-fold advantage results from use of this system: (1) fire hazard from explosion is practically eliminated; (2) it eliminates possibility of human error; (3) it saves a lot of gas, which is expensive to generate. The system is brought into balance automatically, preventing excessive vacuum or excessive pressure being formed by the gas.

Production Courses

Of interest to students of management and manufacturing are many of the new, practical courses currently being offered by the University of Denver downtown adult education center. Included are classes in "Time and Motion Study," "Production Control," "Purchasing," "Wholesale Merchandising," "Labor Legislation" and a variety of others.

DAIRY PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Montana	53	48	5	.....	555	$1,135	258	383	$722	$2,469	$432
Idaho	62	46	15	1	1,295	3,060	707	1,030	2,325	8,020	1,500
Colorado	41	34	7	.....	484	1,070	592	351	701	2,734	615
New Mexico	6	4	2	.....	111	208	78	92	165	382	37
Arizona	9	5	4	.....	233	604	138	176	415	1,579	221
Utah	43	29	14	.....	839	1,776	376	603	1,214	5,520	756
Total Mtn.	214	166	47	1	3,517	7,853	2,149	2,635	5,542	20,704	3,541
Washington	65	50	15	.....	1,015	2,860	1,038	691	1,983	6,437	1,363
Oregon	88	66	22	.....	1,284	3,379	723	994	2,610	8,472	1,057
California	176	119	47	10	4,554	12,769	2,803	3,431	8,950	32,149	4,536
Total Pacific	329	235	84	10	6,853	19,008	4,564	5,116	13,543	47,058	6,956
Total West'rn	543	401	131	11	10,370	26,861	6,713	7,751	19,085	67,762	10,497
Ice Cream and Ices											
Montana	7	4	3	.....	166	$350	33	97	$181	$909	$72
Idaho	7	4	3	.....	156	346	35	86	171	778	* *
Colorado	13	12	1	.....	127	296	160	93	167	915	256
Utah	13	8	5	.....	354	671	85	215	370	1,456	298
Total Mtn.	46	32	14	.....	914	1,871	391	583	1,054	4,440	663
California	94	73	19	2	1,954	5,736	1,043	1,304	3,393	13,003	2,332
Total West'rn	140	105	33	2	2,868	7,607	1,434	1,887	4,447	17,443	2,995
Creamery Butter											
Montana	38	37	1	.....	242	$474	213	178	$333	$1,023	$178
Idaho	22	16	6	.....	510	1,240	426	408	951	3,190	629
Colorado	18	15	3	.....	225	483	310	151	310	1,018	183
Total Mtn.	78	68	10	.....	977	2,197	949	737	1,594	5,231	990
Washington	27	20	7	.....	455	1,256	564	271	746	1,998	314
Oregon	33	24	9	.....	549	1,437	346	395	1,032	3,867	471
California	20	12	7	1	545	1,342	731	463	1,119	4,421	291
Total Pacific	80	56	23	.....	1,549	4,035	1,641	1,129	2,897	10,286	1,076
Total West'rn	158	124	33	1	4,075	10,267	4,231	1,866	4,491	15,517	2,066
Concentrated Milk											
Utah	7	2	5	.....	216	$526	109	166	$378	$2,194	$128
Washington	9	5	4	.....	224	686	234	194	589	2,850	244
Oregon	6	3	3	.....	129	375	105	112	321	1,337	85
California	29	10	13	6	1,514	4,158	709	1,253	3,352	11,845	1,477
Total Pacific	44	18	20	.....	1,867	5,219	1,048	1,559	4,262	16,032	1,806
Total West'rn	51	20	25	6	2,083	5,745	1,157	1,725	4,640	18,226	1,934

GLASS and Glassed Products . . . Up over prewar

POST-WAR readjustment began for the glass container manufacturing industry nationally and on the West Coast in 1947. 1946 was the peak year for this industry. Business has declined each year since then to the point where 1949 will show physical volume in the industry to be about 25 per cent below 1946.

In 1940 there were seven glass container plants on the West Coast. Today there are 12. These expansions were planned during the war, but current decline in business has caused one of the 12 plants to be taken out of operation and put on a stand-by basis.

General opinion in the industry seems to be that 1950 will be a somewhat better year for this industry on the West Coast.

The non-returnable beer bottle, after three years of promotion, seems to offer great possibilities for increased volume next year.

Introduction of baby foods in glass jars by Beech-Nut Packing Company on the West Coast also promises substantial volumes of business for this industry as experience in the east has shown the glass container to be the most favored package for this industry.

Other favorable factors: (1) more stabilized situation in the wine business; (2) increasing transportation costs (which will encourage more bottling on the West Coast rather than bulk shipments); (3) prospect of a larger tomato catsup pack on the West Coast in 1950.

Prices of glass containers have increased less than most commodities, but the industry is hopeful that with somewhat increased volume the profit picture will be satisfactory in 1950.

Recent reports issued by the Department of Commerce show that the glass container industry has returned to its pre-war seasonal pattern which results in spring, summer and fall business about 50 per cent greater than the slower winter months.

This is another indication that the industry has returned to its prewar "normal" and that no further decline in business should be foreseen in 1950.

More Margin Made Market For Meat

Perhaps the most striking example of the effects of freight rate differentials on regional processing is the case of the meat packing industry in Denver, according to Morris E. Garnsey, professor of economics at the University of Colorado, in his forthcoming book on the economy of the intermountain area.

"Before 1945," Professor Garnsey says, "the rate on fresh meat from Denver to the West Coast was about twice the rate on live cattle. This rate favored the shipment of live animals from the cattle area to the consuming centers on the Coast.

"A revision of rates in 1945 reduced the differential to about 100 to 140. As a result, fresh meat and packing house products began to move from Denver to the Pacific Coast. By 1948, such shipments had reached an annual average of approximately 4,000 carloads, as compared with negligible shipments in prewar years.

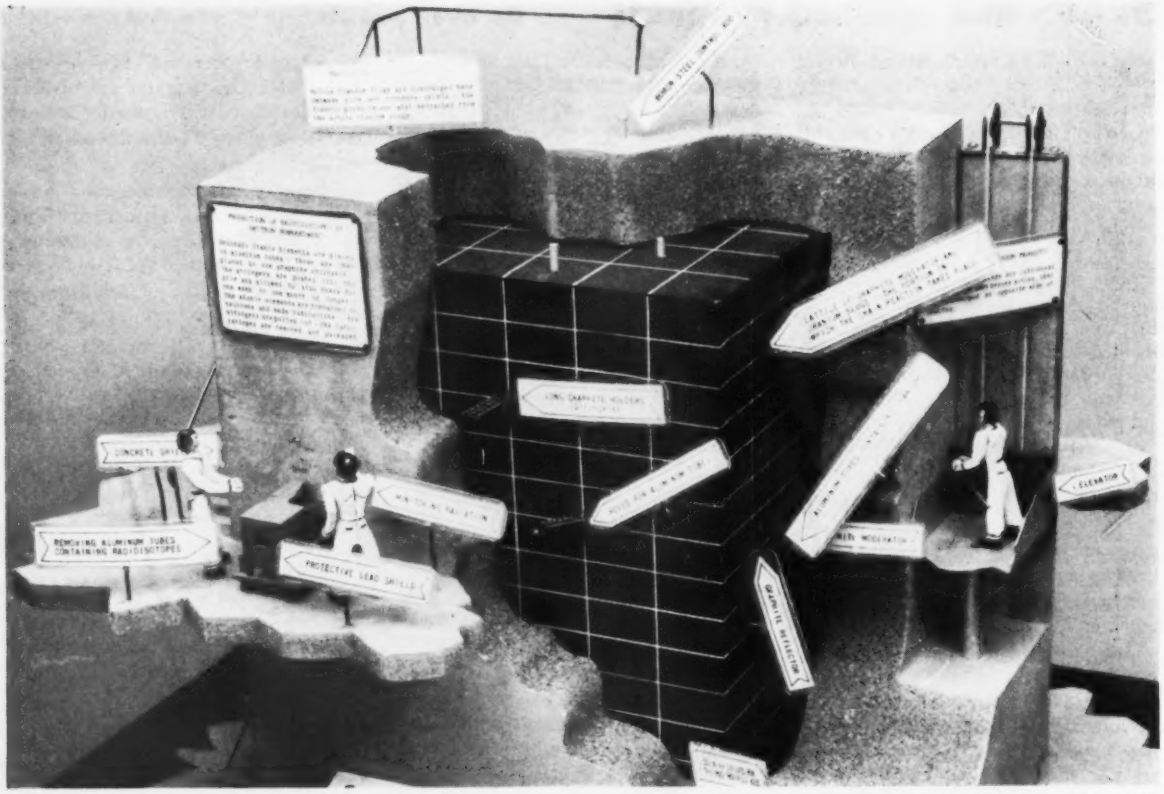
"Thus a single adjustment in rate differentials has greatly stimulated the indigenous processing of one of the Mountain West's basic agricultural products."

Professor Garnsey's book goes into the effects of the war and postwar developments on the area, inventories, resources of the region.

Products of Purchased Glass

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
California	89	80	8	1	816	$2,267	302	740	$2,032	$3,802	$548
Pressed and Blown Glassware (not elsewhere classified)											
California	5	2	2	1	357	$1,023	193	323	$825	$1,482	$133
Beverages											
Montana	39	33	6	.....	500	$1,475	207	350	$943	$3,411	$438
Idaho	28	25	3	.....	276	789	83	158	380	1,863	515
Wyoming	16	14	2	.....	225	624	82	164	404	1,397	183
New Mexico..	43	40	3	.....	332	703	73	191	316	1,474	365
Arizona	37	32	4	1	437	1,076	116	298	638	4,541	475
Utah	32	27	5	.....	437	1,141	145	267	606	3,248	596
Nevada	9	6	3	.....	104	335	40	70	201	692	53
Total Mtn.	204	177	26	1	2,311	6,143	746	1,498	3,488	16,626	2,625
Washington ..	94	73	15	6	2,159	7,559	751	1,521	4,872	20,624	3,834
Oregon	65	58	6	1	739	2,411	188	455	1,421	7,361	2,005
California	486	359	103	24	13,640	44,286	4,230	9,311	28,138	157,469	22,645
Total Pacific..	645	490	124	31	16,538	54,256	5,169	11,287	34,431	185,454	28,474
Total West'rn	849	667	150	32	18,849	60,399	5,915	12,785	37,919	202,080	31,099
Bottled Soft Drinks											
California	231	187	37	7	4,025	$12,656	879	1,732	$4,862	$26,280	$4,854
Malt Liquors											
Montana	8	2	6	.....	302	$984	567	230	$688	$2,481	$290
California	16	.....	5	11	4,144	16,691	1,916	3,305	13,213	48,401	7,215
Total West'rn	24	2	11	11	4,446	17,675	2,483	3,535	13,901	50,882	7,505
Wines and Brandies											
Washington ..	15	13	2	.....	144	$440	88	103	$279	$1,223	$58
California	218	161	53	4	4,650	12,828	1,248	3,661	8,833	68,926	9,566
Total Pacific..	233	174	55	4	4,794	13,268	1,336	3,764	9,112	70,149	9,657



• Model of an atomic pile. Ordinary stable elements are placed in aluminum tubes, which are then placed in graphite stringers. Stringers are pushed into the pile and allowed to stay there for one week to a month or longer. The stable elements are bombarded by neutrons and made radioactive, stringers pulled out, radioisotopes removed and packaged.

Idaho The Site For Nuclear Engineering Laboratory

By L. F. JOHNSTON
Manager, Idaho Operations Office
U. S. Atomic Energy Commission

THE Idaho Reactor Testing Station, the field facility for testing and proving the national reactor development program, is what we might call a nuclear engineering laboratory.

Research and development of new reactors will be done at existing installations, such as Argonne National Laboratory in Chicago, which is the major center for the reactor development program. In Idaho we will be responsible for the design, construction and operation of new types of reactors. AEC research units, working on reactors, and the Armed Forces Agencies, concerned with military utilization of reactors, will use the new facilities.

The First Reactor

In simple language, a reactor is an atomic furnace where atoms are split, under a controlled process, to provide tremendous amounts of energy in the forms of radiation and heat. At the Reactor Testing Station, we intend to try and make the fullest use of both forms of energy. For example, we have our first reactor, which is now under construction at the Reactor Testing Station, and which is known as the Experimental Breeder. It is designed to produce more fissionable material, that is more fuel, than is consumed in the reaction process and, at the same time, take advantage of the heat energy that is given off during the fission process.

The Second

A second reactor scheduled for the Reactor Testing Station is also one of prime importance to the atomic energy reactor development program. Known as the Materials Testing Reactor, it will utilize a high neutron flux to test materials for use in the construction of future reactors. This reactor is also of prime importance inasmuch as it represents a great forward step into the field of compact, high radiation density reactors, which will ultimately be used as sources of power.

This second project will be much larger than our first one. We expect that the Experimental Breeder will cost in the neighborhood of $3,500,000, while the Materials Testing Reactor will cost upwards of $25,000,000. We plan to start construction of the latter as soon as the weather breaks in the spring.

And the Third

The third reactor planned for our Idaho Station is the Ship Propulsion Reactor, now being developed by the Argonne National Laboratory and the Westinghouse Manufacturing Company. It will be a large single purpose unit, developed for the sole purpose of producing large amounts of heat which will permit conversion to propulsive power. This might well be a prototype for the first practical use of atomic power. The strategic value of such a unit is quite easy to visualize.

Also on our schedule for the immediate future is a chemical separations plant

L. E. JOHNSTON

for the recovery and decontamination of fuel elements used in our various reactors. This will be a highly complex and intricate plant, designed around research and developmental work which has gone on in our national laboratories at Schenectady, Oak Ridge and Argonne. I have recently appointed a Processing Advisory Committee, composed of Dr. Schumacher of the Standard Oil Development Company, Dr. Lawroski of the University of Chicago, Dr. Marsden of the General Electric Company, Dr. Culler of the Carbide and Carbon Chemicals Corporation, to advise and consult with us on the development of this highly important plant.

Other reactors will come along as part of our reactor development program as rapidly as the scientists in our various laboratories are able to bring them to the stage where they are ready for our office to pick up the design. I feel that we have in this reactor program something for you and for me to be enthusiastic about. Here we have a multi-purpose program directed toward production of fissionable material, production of power and propulsion of ships and aircraft.

Ultimately we will use thousands of gallons of water, much of which will be returned to the earth. We will take this water in its natural form and it will be treated to almost the same purity as distilled water.

There has been some question raised about the possible contamination of the underground waters, through the uses of the desert for atomic energy work. The Commission has an overriding responsibility to safeguard people against radiation that originates in atomic production and research. It must protect the health of scientists and workers in the Commission and other installations and of the people who live nearby.

All the knowledge that scientists gain in their study of the effects of radiation helps the Commission to insure adequate protection. It is the policy of the Commission to be super safe in such things. For example, one of the reasons for the selection of an isolated area for the Reactor Testing Station is the very remote possibility of danger which might result from a serious accident to a reactor.

We all know that it is not possible for a reactor to create a bomb-like explosion. There have been no serious accidents to any of our reactors which have been built since the first reactor in 1942. The safety record at AEC installations has excelled that in all other industry. Still, in an industry as new and untried as the atomic energy industry, it seemed prudent to do our engineering experimentation in an area where an accidental spill or other accident would do no harm to surrounding communities.

HANDLING RADIOACTIVE WASTES

(From Atomic Energy Commission Report, October 1949)

The process of nuclear fission (splitting) going on in operating reactors creates considerable quantities of heat which must be carried away. The reactors at Hanford, Washington, are cooled by water; those at Oak Ridge, Tenn., and Brookhaven, Long Island, are cooled by prodigious quantities of air. In both cases, the air or the water is discharged from the reactor building and not reused; these are open-cycle operations.

For the power and test reactors of the future other coolants are being developed for closed-cycle operation—that is, the coolant will circulate in a closed system. This will greatly cut down the amount of radioactive materials discharged to the air or the ground and simplify the problems of waste-handling.

The cooling water is drawn from the Columbia River, at Hanford, purified in the normal manner, pumped through the plutonium-producing reactors, held in a retention basin to permit decay of much of the radiation picked up by soluble salts in the water, and then discharged back into the river. The exit temperatures may be several degrees above river water but the temperature of the river as a whole is not noticeably changed.

Hot metal slugs containing uranium, plutonium, and fission products are ejected from the piles at Hanford and allowed to *cool* to permit the decay of a large amount of the short-life activity, such as that of radioiodine. This material is then chemically processed to recover the valuable fissionable material, *plutonium*. The material goes through rather conventional processing steps, such as dissolving, precipitating, and washing—operations which are conducted by remote control behind many feet of concrete.

Special ventilation is used. Ventilating air contaminated with radioactive particles from these processes passes through scrub traps, filters, and out a stack. Again discharge from the stacks is carefully controlled according to meteorological conditions—that is, discharge of the contaminated air is permitted only when the wind is right to carry the discharge into the upper atmosphere. This results in high dilution and safe operation.

During chemical processing, the liquids increase in volume and hence the radioactivity per gallon is reduced from step to step. Ultimately, the most radioactive of the wastes are stored in tanks underground. Wash wastes are also tanked, but are discharged after a sufficient period of decay. This practice was adopted during the war, but it is being replaced by better methods as fast as they can be developed.

Recent improvements in processing techniques have reduced the volume of liquid wastes which must be stored by 20 per cent. It is expected that the amount will be reduced to 50 per cent in the near future, which will result in saving about $1,000,000 a year.

At Hanford, health physicists have given careful consideration to certain short-lived gaseous wastes from chemical separation operations, primarily eight-day radioiodine (iodine 131) and 5.4-day radioxenon (xenon 133). The amount of such wastes can be regulated by increasing the cooling period between the time the slugs are taken from the reactor and the time that metal processing begins. For example, by increasing the cooling period 60 days (seven half-lives), the amount of radioiodine may be decreased by more than 100 times.

At present the radioiodine concentration in the atmosphere over Richland, Pasco, and Kennewick (Hanford area) is about 1/100,000,000 microcuries per cubic foot.

The slow seepage of low-activity wastes into the ground at Hanford has been safe to date because of the nature of subsoils. These soils tend to have a chemical affinity for most of the radioactive materials, so that they do not spread through the soils for great distances. While this method of disposal has proved a useful and safe temporary measure, it is not a satisfactory disposal method for permanent use. Geologists estimate that present practices may continue for many years without creating a public hazard. In view of present research efforts, the practice will undoubtedly be abandoned long before this period has elapsed.

Research workers at Los Alamos have started an unusual series of studies to determine whether or not radioactivity can be concentrated from liquid wastes by bacterial action. Early experiments indicate that certain bacteria normally used in activated sludge processes for treatment of sewage do concentrate radioactivity to an unusual degree. As soon as more data are available, pilot plant operations will be established for use of biological methods on a routine basis. If successful, the method will be far simpler and less costly than chemical or mechanical methods.

FURNITURE . . . Western styles lead

APPEARANCE of foam rubber on the market during the past year in adequate quantities and at lower prices brought this material into use by at least 50 per cent of the West's furniture manufacturers, extensively replacing types of construction that have been standard for 200 years.

The foam mattress swept the bedding field, creating such a demand as to tax the greatly enlarged capacity of the rubber industry. Foam rubber is now being put into moderate-priced upholstered chairs, sofas, and sectionals, used alone as a 4-inch slab, or as a thinner layer over springs.

Plastic materials such as Duran, Boltaflex, Nylon, and Kaliston gained ground rapidly in upholstery fabrics and as protective material for headboards, ottomans, and other items.

Somewhat lower prices permitted wide acceptance of the plastics in making of utility home furniture such as chrome breakfast chairs, displacing leather, leatherette, and other materials.

Use of resin glues has continued to grow.

Further growth occurred in chrome furniture production, which has expanded nearly seventy-fold in the past decade.

One Los Angeles plant which has installed complete assembly line production, in addition to rolling and plating its own tubing, will top $8,500,000 this year, representing an estimated 10 per cent of the nation's production.

A big advance was the use of automatic machinery for roll forming tubes, permitting bending of smooth continuous reverse curves without cumbersome jigs and hand work.

Strong continuance of home building helped offset deflationary forces in the furniture field. Sales fell off early in 1949, along with the general decline in retail sales, but later picked up sharply. At year's end, many Western plants were running two or three shifts on dining and bedroom furniture.

A strong trend appeared toward smaller furniture to fit the small rooms of the mass-built "economy house." Television already has brought new styles, including tables with revolving tops for holding small television receivers, and living room chairs which pivot or turn on casters so guests can watch programs, yet join in conversation.

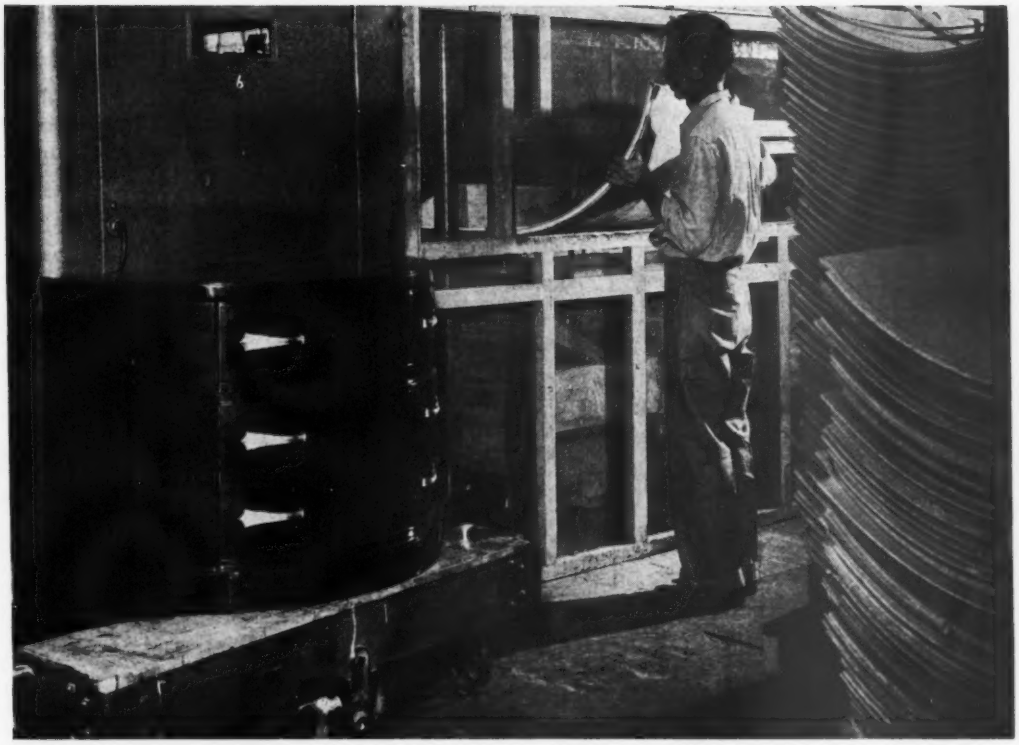
FURNITURE AND FIXTURES

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Number of establishments with			All employees		Production workers				Expenditures for new plant & equipment
	Total number of establishments	1-19 employees	20-99 employees	100 employees and over	Number (average for year)	Salaries & wages, total	Number (average for year) 1939	Number (average for year) 1947	Wages, total 1947	Value added by manufacture	
Montana	5	3	2	.....	110	$279	15	88	$178	$135	.....
Idaho	9	9	.....	.....	24	**	7	24	**	**	**
Wyoming	1	1	.....	.....	**	**	**	**	**	**	**
Colorado	40	28	11	1	672	1,486	349	591	1,197	2,655	148
New Mexico	9	8	1	.....	144	280	15	124	215	429	55
Arizona	16	13	3	.....	264	577	49	229	467	1,077	57
Utah	23	16	7	.....	376	1,087	183	334	874	1,392	99
Total Mtn.	103	78	24	1	1,590	3,709	618	1,390	2,931	5,688	359
Washington	107	77	23	7	3,200	8,330	1,767	2,879	6,834	13,315	633
Oregon	64	42	14	8	3,472	9,953	2,526	3,215	8,504	15,300	592
California	846	636	175	35	18,511	56,634	9,804	16,261	46,352	91,872	5,613
Total Pacific	1,017	755	212	50	25,183	74,917	14,097	22,355	61,690	120,487	6,838
Total West'rn	2,034	1,510	424	100	50,366	149,834	28,194	44,610	126,311	240,974	13,676
Household Furniture											
Colorado	19	13	6	.....	305	$689	281	278	$597	$1,322	$75
New Mexico	6	5	1	.....	120	224	15	100	159	339	50
Arizona	9	7	2	.....	178	371	31	151	291	849	39
Utah	15	9	6	.....	275	707	**	253	592	891	24
Total Mtn.	43	29	14	.....	758	1,767	312	682	1,480	3,062	138
Washington	64	40	17	7	2,746	7,145	1,612	2,480	5,805	11,465	587
Oregon	36	22	7	7	2,985	8,398	2,042	2,793	7,198	12,773	519
California	512	369	113	30	13,421	40,584	7,043	11,870	33,123	64,215	4,055
Total Pacific	612	431	137	44	19,152	56,127	10,697	17,143	46,126	88,453	5,161
Total West'rn	655	460	151	44	19,910	57,894	11,009	17,825	47,606	91,515	5,299
Wood Office Furniture											
California	12	9	3	.....	160	$486	87	139	$367	$630	$122
Public and Professional Furniture											
California	19	12	7	.....	359	$1,065	138	299	$795	$1,747	$41
Partitions and Fixtures											
Colorado	12	7	4	1	294	$631	**	253	$462	$960	$59
Washington	20	18	2	.....	176	577	109	160	509	795	24
California	134	101	30	3	2,460	8,742	1,527	2,170	7,527	14,295	807
Total Pacific	154	119	32	3	2,636	9,319	1,636	2,330	8,036	15,090	831
Total West'rn	166	126	36	4	2,930	9,950	1,636	2,583	8,498	16,050	890
Screens, Shades and Blinds											
Washington	15	13	2	.....	159	$329	46	143	$291	$663	$10
California	133	116	15	2	1,691	4,499	981	1,410	3,472	8,588	375
Total West'rn	138	129	17	2	1,850	4,828	1,027	1,553	3,763	9,251	385
Restaurant Furniture											
California	24	21	3	.....	217	$670	***	197	$607	$1,261	$112

*** *Not available*

** Withheld to avoid disclosing figures for individual companies.



Los Angeles Period Manufacturing Company With 15,000-watt High Frequency Generator Turns Out Three-Foot Square Panels in Two Minutes

FURNITURE AND FIXTURES—(Cont'd)

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Wood House Furniture (except upholstered)											
Washington ..	33	21	9	3	1,529	$3,838	1,138	1,402	$3,160	$6,328	$376
Oregon	16	10	2	4	2,274	6,520	1,637	2,148	5,564	9,342	436
California	259	196	48	15	5,873	17,398	3,098	5,283	14,609	26,714	1,312
Total Pacific..	308	227	59	22	9,676	27,756	5,873	8,833	23,333	42,384	2,124
Household Furniture (upholstered)											
Colorado	9	6	3	.....	158	$377	122	145	$333	$684	$14
Utah	9	5	4	.....	162	407	**	148	340	612	2
Total Mtn.	18	11	7	.....	320	784	122	293	673	1,296	16
Washington ..	23	14	6	3	953	2,546	291	850	2,045	3,816	116
Oregon	14	8	3	3	602	1,605	194	552	1,417	2,804	70
California	156	110	39	7	3,566	10,425	2,303	3,196	8,755	16,622	1,051
Total Pacific..	193	132	48	13	5,121	14,576	2,788	4,598	12,217	23,242	1,237
Total West'rn	211	143	55	13	5,441	15,360	2,910	4,891	12,890	24,538	1,253
Mattresses and Bedsprings											
California	65	40	19	6	3,121	$10,179	1,369	2,640	$7,630	$15,616	$1,501
Public-Building Furniture											
California	11	7	4	.....	200	$637	53	163	$478	$701	$40
Professional Furniture											
California	8	5	3	.....	159	$428	85	136	$317	$1,046	$1
Venetian Blinds											
California	110	100	9	1	1,161	$2,977	776	973	$2,302	$5,022	$188

** Withheld to avoid disclosing figures for individual companies.

Canning Requires Much Water

It requires 10 gallons of water to prepare a No. 2 can of lima beans for the market, according to Dr. Stanley B. Freeborn, assistant dean, college of agriculture, University of California.

"This is almost half the amount actually required to grow the product. It takes seven gallons of processing water for a similar can of spinach, and three gallons for a small can of asparagus. Sweet wines require about seven gallons of processing water for each gallon of wine.

"To switch to a non-food agricultural product, 35 gallons of water are used to process every pound of mercerized cotton goods. Still farther afield is the fact that every drum of crude oil involves the usage of 770 gallons of water."

Hard and Soft Board

The two producers of hardboard in Oregon have a capacity of 80,000 square feet of ¼-inch base stock per day, according to the Oregon Chemical Market Research Group. The one principal softboard manufacturer has a capacity of 250,000 square feet of ½-inch base stock material. Douglas fir waste is the principal ingredient of these industries.

RUBBER . . . Los Angeles second to Akron

PERHAPS the most surprising trend, in the opinion of rubber consumers, is the readiness of rubber consumers to adapt the product to new uses, particularly in the field of eliminating friction by isolating vibration of machines close to the source. One example is a washing machine operating at 250 cycles a minute, where rubber mounts are used for a completely enclosed motor that requires no lubrication.

Coast manufacturers of camelback and tire tread have gone strongly toward the use of Buna S GRS in the so-called cold rubber process, which is polymerized at 41°F. This provides a product considered better than natural rubber. Polymerizing at 14° or even 0° has been successful, producing an even tougher material, but at these lower temperatures the processing is so slow as to be impractical.

• Inspecting tires after manufacturing is completed at Goodyear L. A. factory.

ESTIMATED 1949 CONSUMPTION OF CRUDE RUBBER BY SOUTHERN CALIFORNIA RUBBER INDUSTRY*

Prepared by Ralph T. Hickox, Goodyear Tire & Rubber Co., Inc., Los Angeles, for Chemical Market Research Group of Southern California

	Monthly Consumption Mid-Year 1949 Short Tons	Estimated 1949 Consumption Short Tons
Natural Rubber	3,785	45,420
Styrene Rubber — GRS	2,627	31,524
Butyl Rubber — GRI	1,060	12,720
Neoprene — GRM	94.1	1,130
Acrylonitrile Rubber (Buna N)	34.2	410
Reclaimed Rubber	1,552	18,624
Total	9,152.3	109,828

* Based on survey of 54 rubber companies. Mid-year production level assumed as 1949 average consumption.

Estimated Consumption of Chemical Raw Materials

Material	Consumption Factor	Source of Information*	Estimated 1949 Consumption Short Tons
Total Crude Rubber	100.00	①	100,000
Vulcanizing and Modifying Materials			
Accelerators	1.00	②	1,100
Antioxidants (Total)	1.00	②	1,100
Lime	0.39	③	429
Litharge	0.15	③	165
Softeners and Plasticizers (Total)	7.00	②	7,700
Asphaltic	1.83	②	2,013
Refined Petroleum	3.84	②	4,224
Coal Tar Products	0.21	②	231
Pine Tar	1.05	②	1,155
Esters and Ethers	0.07	②	77
Stearic Acid	0.75	②	825
Sulfur	4.75	③	5,225
Waxes	0.50	②	550
Zinc Oxide	5.35	③	5,885
Pigments			
Barytes	1.09	③	1,199
Carbon Black	29.40	③	32,340
Clay	11.10	③	12,210
Lithopone	0.19	③	209
Miscellaneous Processing Aids			
Mica	0.29	④	319
Talc	4.36	③	4,796
Solvent (Naphtha)	20 gal./ton crude	②	2,200,000 gallons

*① Survey of 54 Southern California rubber companies.
② Estimated from typical rubber compounds.
③ Department of Interior, Bureau of Mines "Mineral Yearbook."

RUBBER PRODUCTS

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	Number of establishments with: 1-19 employees	20-99 employees	100 employees and over	All employees: Number (average for year)	Salaries & wages, total	Production workers: Number (average for year) 1939	1947	Wages, total 1947	Value added by manufacture	Expenditures for new plant & equipment
Colorado	2	.....	1	1	* *	* *	* *	* *	* *	* *	.....
Washington	5	4	1	.....	* *	* *	* *	* *	* *	* *	* *
Oregon	5	3	2	.....	123	$356	* *	102	$251	$587	$25
California	103	67	24	12	* *	* *	* *	* *	* *	* *	* *
Total Pacific	113	74	27	12	123	356	.....	102	251	587	25
Total West'rn	115	74	28	13	123	356	.....	102	251	587	25
Tires and Inner Tubes											
California	7	2	.....	5	10,579	$34,972	3,603	8,969	$28,023	$60,918	$3,978
Rubber Industries (not elsewhere classified)											
California	95	64	24	7	3,304	$9,353	1,262	2,645	$6,490	$14,699	$2,384

* * Withheld to avoid disclosing figures for individual companies.

MOTION PICTURES . . . Hollywood—'nuff said

Materials Used by Motion Picture Studios in Hollywood

Estimates of Consumption in 1948 by Dr. Herbert Meyer, Motion Picture Research Council, Inc.

35 mm negative raw film (all types)	80,000,000 lin. ft.
35 mm positive type raw film	800,000,000 lin. ft.
Main Ingredients For Above	
Silver	50 tons
Cotton	600 tons
Specially processed gelatin	300 tons
Chemicals Used by Film Developing & Processing Laboratories in Hollywood	
p-Methylaminophenol sulfate (metol)	9 tons
Hydroquinone	22 tons
Sodium thiosulfate (hypo)	400 tons
Sodium sulfite, anhydrous	300 tons
Sodium carbonate, monohydrate	100 tons
Borax	28 tons
Glacial acetic acid	17 tons
Potassium alum	16 tons
Sodium metaborate	2 tons
Potassium bromide	1 ton
Set Construction Materials	
Plaster of Paris	3,000 tons
Casting plaster 85%	
Art plaster (plaster plus dextrin) 10%	
Hard wall plaster (calcined or resin additives) 5%	
Fiberglas	15 tons
Natural fibers (mainly sisal)	50 tons
Shellacs	40,000 gals.
Paint lacquers	11,000 gals.
Flat paints—oil base	32,000 gals.
Flat paints—water base	15,000 gals.
Paint enamels	6,000 gals.
Varnishes	4,000 gals.
Paint thinners	40,000 gals.
Lacquer thinners	35,000 gals.
Denatured alcohol	40,000 gals.
Turpentine	10,000 gals.
Kerosene	10,000 gals.
Acetone	2,000 gals.
Linseed oil	2,500 gals.
Whiting and titanox	20 tons
Earth pigments and dry colors	95 tons
Oil putty	6 tons
Spackling putty	6 tons
Carbon tetrachloride	7,000 gals.
Stearic acid	2 tons
Floor wax—liquid & paste	6,000 gals.
Floor cleaning compounds	25 tons
Soap and detergents	17 tons
Bronze powders	2 tons
Moth crystals	4 tons
Mold glue (gelatin)	10 tons
Casting plastics (phenolics, isopol)	2 tons
Laminating plastics (polyesters)	6 tons
Flexible mold materials (polyvinyl derivatives)	5 tons
Examples of Other Materials Used in Large Quantity by the Industry	
Lumber	20,000,000 bd.ft.
Plywood	2,000,000 sq.ft.
Masonite	2,000,000 sq.ft.
Celotex	2,000,000 sq. ft.
Textiles for backdrops, cycloramas, etc. (canvas, cheesecloth, etc.)	2,000,000 sq.ft.
Textiles for diffusion cloth (canvas, denim, nylon, etc.)	500,000 sq.ft.

• Director Michael Curtiz shows Kirk Douglas where to stand during a scene with Lauren Bacall for Warner Bros.' musical drama "Young Man With a Horn." Cinematographer Ted McCord at extreme right, focussing his camera for this "shot."

New Mexico Starts Industrial Conferences

New Mexico held its first Conference on Industrial Development in Albuquerque last June 29. Sponsored jointly by the New Mexico School of Mines, the New Mexico College of Agriculture and Mechanical Arts, and the University of New Mexico, the conference emphasized the need for economic and technological research as the fundamental basis of industrial development and the growth of a region's economy, the areas of research needed in the Southwest, the facilities and talent the science and engineering departments of the state-supported schools can bring to bear on the problems of industrialization, and the financial aspects of industrial development.

The last New Mexico legislature created an Economic Development Commission, and at the conference at Albuquerque the state was described as one of the last of the great industrial frontiers, "blessed with about everything a chemist and engineer needs for a roaring industrial economy, but up to now very little is being done about it."

CERAMICS . . . Pottery pioneers

CERAMIC industry in the West has for the most part been running along on a "business as usual" basis, incorporating only such industrial improvements as were generated during the normal course of developing events.

But lately, a new and costly factor has been projected into this industry's midst, serving to stimulate research, improvement, and innovations where possible.

Labor is that stimulant. Wage rates on the Pacific Coast in this industry have gone up faster than those of other sections of the country. For instance, for a given type of job in a midwest factory where the wages for that job are $.90 to $1.12 per hour, California manufacturers must pay $1.43 per hour for the same work.

In order to cope with eastern competition, Western ceramics manufacturers have taken a number of forward steps. Some of these are:

Automatic jiggering on flatware.This operation used to be done by manually operated machines; now they are automatically controlled. Production output has been at least doubled on that phase alone.

A chain reaction was thereby set up, since faster operating kilns had to be developed to take this increased output. Hence, tunnel type kilns, a decided improvement in design, are becoming universally accepted by this industry. Within the past year, firing times have been thus increased from 15 per cent to 20 per cent.

Methods of hydraulic pressing of cups, saucers, and creamers, etc., are now under study. Current practice is to cast such items, but hydraulic operations may prove to be more efficient.

In tile production, improved pressing methods have been developed.

Vitrified sewer pipe has heretofore been made on vertical presses; now it is being made horizontally by extrusion processing, using auger machines. Result is an improved product and reduced product cost, although production quantities are not appreciably stepped up.

Generally, the industry is swinging toward mechanization, particularly in the materials handling phase. Pallets and conveyor systems are becoming more common.

Members of the ceramic industry and of sections of the American Ceramic Society have cooperated to establish educational and research activities in ceramic engineering at the University of California at Berkeley during 1948, and at UCLA during 1949.

At Berkeley the emphasis is on technology. Thorough studies are made of non-metallic raw materials such as talcs, clays, sands, perlites, and others that will involve use of such techniques as X-ray diffraction, spectrographic, petropgraphic, and differential thermal analyses. These are supplemented by composition studies involving phase rule investigations and applications, solid state reactions, and the relationship of all of these studies to production problems.

At Los Angeles the emphasis is on engineering. Problems involve forming,

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
STONE, CLAY AND GLASS PRODUCTS					
Montana	53	569	502	$3,607	$217
Idaho	28	328	272	1,614	274
Wyoming	15	330	265	1,489	162
Colorado	108	2,430	2,169	11,966	3,964
New Mexico	6	17	17	33	.....
Arizona	82	863	741	3,616	692
Utah	58	1,092	934	5,627	4,234
Nevada	22	407	357	2,942	**
Total Mtn.	372	6,036	5,257	30,894	9,543
Washington	167	3,320	2,907	17,203	2,709
Oregon	108	1,172	1,033	6,536	1,848
California	1,065	27,160	23,825	153,884	33,368
Total Pacific	1,340	31,652	27,765	177,623	37,925
Total Western	1,712	37,688	33,022	208,517	47,468
Concrete and Plaster Products					
Colorado	56	469	416	$2,392	$306
Arizona	65	636	545	2,623	432
Utah	38	496	402	2,013	1,516
Total Mtn.	159	1,601	1,363	7,028	2,254
Washington	108	1,072	928	5,103	771
Oregon	77	445	398	2,249	211
California	483	5,938	5,219	32,495	10,652
Total Pacific	668	7,455	6,545	39,847	11,634
Total Western	827	9,056	7,908	46,875	13,888
Concrete Products					
Idaho	22	204	175	$860	$213
Colorado	51	370	338	1,875	265
Arizona	60	517	438	2,138	340
Utah	30	324	251	1,391	336
Total Mtn.	163	1,415	1,202	6,264	1,154
California	457	4,620	4,112	22,542	2,916
Total Western	620	6,035	5,314	28,806	4,070
Cement, hydraulic					
California	11	3,455	2,864	$30,039	$6,587
Gypsum Products					
California	9	809	684	$6,660	**
Cut-Stone and Stone Products					
California	16	200	173	$893	$22
Gaskets and Asbestos Insulations					
California	23	423	336	$2,502	$208
Minerals (Ground or Treated)					
California	18	1,050	817	$8,420	$860
Miscellaneous Nonmetallic Mineral Products					
Washington	13	500	416	$3,201	**
Structural Clay Products					
Colorado	25	981	881	$3,405	$257
Arizona	6	166	149	736	71
Utah	5	281	251	1,147	85
Total Mtn.	36	1,428	1,281	5,288	413
Washington	19	631	577	2,681	373
Oregon	16	222	183	998	126
California	89	4,022	3,604	18,357	2,579
Total Pacific	124	4,875	4,364	22,036	3,078
Total Western	160	6,303	5,645	27,324	3,491
Brick and Hollow Tile					
Colorado	18	308	275	$1,188	$64
California	35	908	819	3,651	444
Total Western	53	1,216	1,094	4,839	508
Structural Clay Products (not elsewhere classified)					
California	25	851	720	$3,522	$441
Pottery and Related Products					
California	263	5,239	4,905	$21,991	$2,354
Earthenware Food Utensils					
California	34	2,538	2,390	$11,040	$1,270
Pottery Products (not elsewhere classified)					
California	215	1,729	1,640	$5,705	$455

** Withheld to avoid disclosing figures for individual companies.

• Hand jiggering of dinner plates for Franciscan fine china at Gladding, McBean & Co. in Los Angeles. Man on the left is batting out pieces for jiggerman at the right.

drying, firing, and application of thermodynamic principles to these studies, as well as determining the relationship of these studies to material properties. Research activities at the two institutions are planned to complement each other as much as possible.

Research activities in any branch of ceramics will be largely controlled by the interest shown by industry.

Industry Needs Water

Present total water use in Los Angeles, according to Samuel B. Morris, general manager, Los Angeles Department, averages 350,000,000 gallons a day. This is an increase of more than 50 per cent over the city's needs in 1940. The amount of water required for each resident of the city also has grown, largely as a result of industrial expansion, according to Morris. "Now it takes 150 gallons of water a day for each resident, exclusive of irrigation water, while the daily per capita use in 1940 was only 120 gallons."

More Cottonseed

California ranked fifth among the states in receipts of cottonseed at mills in October 1949, with 137,992 tons. Arizona received tons 28,869. Combined tonnage from these two states, runs second only to Texas, whose receipts totaled 357,969 tons.

Wood Preservatives

Three Pacific Coast States

From American Wood Preservers Ass'n

Consumption, 1947

Creosote	16,606,826 gals.
Petroleum	11,112,933 gals.
Miscellaneous	811,426 gals.
Total Liquids	28,531,185 gals.
Chromated Zinc Chloride	892,753 lbs.
Wolman Salts	551,704 lbs.
Pentachlorophenol	912,363 lbs.

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
Leather and Leather Products					
Montana	1	**	**	**	**
Idaho	4	14	13	$54	$2
Wyoming	1	.....	**	**	**
Colorado	19	1,180	986	4,370	87
New Mexico	6	17	17	33	.....
Arizona	3	**	**	**	**
Utah	2	**	**	**	**
Nevada	1	**	**	**	**
Total Mtn.	37	1,211	1,016	4,457	89
Washington	19	395	354	1,799	49
Oregon	26	335	292	1,370	93
California	247	5,790	4,957	25,381	1,071
Total Pacific	292	6,520	5,603	28,550	1,213
Total Western	329	7,731	6,619	33,007	1,302
Leather Tanning and Finishing					
California	14	693	631	$5,236	$118
Industrial Leather Belting					
California	12	611	430	$2,299	$27
Footwear (except rubber)					
Oregon	7	112	103	$475	$9
California	75	2,495	2,234	9,804	387
Total Pacific	82	2,607	2,337	10,279	396
Leather Work Gloves					
California	16	171	148	$562	$8
Luggage					
California	40	839	714	$3,808	$369
Handbags and Small Leather Goods					
California	35	326	294	$1,177	$19
Handbags and Purses					
California	28	287	260	$1,017	$19
Miscellaneous Leather Goods					
California	34	429	308	$1,578	$36
Saddlery, Harness and Whips					
California	9	126	110	$611	$8
Leather Goods (not elsewhere classified)					
California	25	303	198	$967	$28
Jewelry and Silverware					
California	115	1,026	877	$5,737	$59
Jewelry (precious metal)					
California	87	580	488	$3,660	$27
Silverware and Plated Ware					
California	13	365	313	$1,607	$30
Musical Instruments and Parts					
California	11	314	285	$1,226	$35
Toys and Sporting Goods					
Colorado	21	745	692	$2,091	$51
Washington	33	216	189	670	27
Oregon	20	208	194	729	29
California	199	2,049	1,774	7,608	488
Total Pacific	252	2,473	2,157	9,007	544
Total Western	273	3,218	2,849	11,098	595
Games and Toys (not elsewhere classified)					
California	75	798	673	$3,273	$217
Sporting and Athletic Goods					
California	95	739	652	$2,614	$142
Office Supplies					
California	56	572	436	$3,377	$191
Pens and Mechanical Pencils					
California	12	199	150	$1,342	$89
Hand Stamps and Stencils					
California	34	189	140	$997	$58

** Withheld to avoid disclosing figures for individual companies.

PLASTICS . . . A growing Western industry

(U. S. Department of Commerce Report)

THERE is a large potential growth for the resins and plastics industry on the West Coast in view of the population growth and increased use of consumers products. A tabulation of products would include parts for automobiles, electrical equipment, radios, refrigerators, and other items that could consume around 180 million pounds of resins and plastics materials. However, only about half of this amount or 90 million pounds of resins and materials will be consumed for converting purposes in 1949.

The West Coast has few large assembly industries and these industries in the east provide the largest market either direct or indirect for eastern plastics materials suppliers. On the West Coast there is no production of plastics materials except phenolformaldehyde and urea-formaldehyde resins, and ion exchange resins by one company.

Almost all molding compounds consumed come from the east and molding is largely a custom operation. Phenolic resins consumed for plywood, hardwood and fiber bonding in the West are now made almost exclusively in that area.

About 5 or 6 million pounds of low-pressure laminates from polyesters will be manufactured on the West Coast. High-pressure laminates, however, will continue to be largely shipped from the east. Most laminating resins are made in the east while about half of the surface coating resins that are consumed in the West are manufactured on the West Coast.

Another Stick or Two of Candy

California advanced from fourth place to third place in candy manufacturing from 1946 to 1948, according to the Department of Commerce report "Confectionery Sales and Distribution in 1948." NewYork is in first place. Upwards of 2.5 billion pounds of candy are produced annually, about 18 pounds per capita, but California's per capita sales are only 17.8.

Sales of confectionery manufacturer-wholesalers in the package goods line increased in California from 17,075,000 pounds in 1947 to 25,310,000 in 1947 to 20,675,000 pounds in 1948. Bulk and penny goods also declined in sales. In 1947, 13,470,000 pounds were sold, in 1948, sales totaled 12,572,000 pounds.

Wee Bit of Uranium

Two hundred pounds of uranium metal produced from uranium oxide purchased by the Mallinckrodt Chemical Works from processors of domestic ore in the Colorado area has been authorized for use under Atomic Energy Commission license in non-Commission research projects in the United States. It will be specially produced and fabricated in the form of rods by Mallinckrodt at their St. Louis plant. The retail price will be approximately $50 a pound.

Timber Land Speculation

So far as lumbermen are concerned, the most needed change in the general mining laws is separation of surface and subsurface resources, so that speculators cannot file mining claims free on timber land and then re-sell the timber, according to R. T. Titus, executive vice-president of the Western Forest Industries Association, in a statement before a recent conference on revision of the mining laws held at Spokane.

INTERMOUNTAIN AREA REQUIREMENTS

Prepared by Department of Chemical Engineering and Bureau of Business and Economic Research, University of Utah

(Area of which Salt Lake City is the business center, and extending Westward into eastern Nevada, northward to Boise, Idaho, eastward almost to the Continental Divide, southward to the Grand Canyon.)

Units: Short tons

Industry	Caustic	Inorganic Acids	Alkali Chlorides	Other Soluble Inorganic Salts	Industrial Gases	Other Heavy Chemicals
Petroleum Refining	150	1,600	.....	1,610	10	50
Agriculture	.....	.....	77,100	22,650	.....	18,840
Metallurgical	440	17,200	.....	.....	.....	490
Food	470	3,000	1,500	760	7,400	1,010
Public Utilities	.....	.....	.....	20	.....	150
Building	.....	.....	.....	1,920	.....	.....
Other	.....	2,600	1,600	5,860	.....	4,010
Not Classified	400	35,900	.....	830	3,990	.....
Total Consumed	1,460	60,300	80,200	33,650	11,400	24,550
Total Produced	.....	59,000	184,000	23,220	15,000	292,000

Allied Materials

Units: Short tons

Industry	Clays	Portland Cement	Insulating Materials	Gypsum, Lime Limestone	Other
Petroleum Refining	1,650	.....	.....	1,700	.....
Metallurgical	.....	.....	.....	110,850	.....
Food	810	.....	.....	71,510	.....
Public Utilities	.....	.....	.....	1,450	.....
Building	.....	386,000	11,600	43,000,000	172,700
Other	140	.....	.....	.....	.....
Not Classified	181,890	.....	.....	.....	.....
Total Consumed	184,490	386,000	11,600	.....	172,700
Total Produced	181,870	386,000	30,100	86,196,650	172,700

Fuels and By-Products

Industry (Units)	Coal[1] 1,000 Tons	Fuels, Lubricants from Petroleum 1,000 Bbl.	Heavy Petroleum, Coal Tar Fractions[2] Tons	Organic Solvents[3] Bbl.	Waxes Tons	Natural Solid Bitumens Tons
Metallurgical	2,260[4]	.....	.....	.....	.....	.....
Transportation	1,030	7,380	1,250	2,000	.....	.....
Food	.....	.....	6,620	.....	960	.....
Building	.....	.....	75,000	.....	.....	4,800
Other	.....	.....	.....	3,480	50	.....
Not Classified	520	6,790	13,000	20,940	.....	550
Total Consumed	3,810	14,170	95,870	26,420	1,010	5,350
Total Produced	6,700	15,590	152,650	190,640	2,165	59,800

[1] Utah coal only, domestic heating not considered.
[2] Creosote, heavy coal tar acids and bases, road oil, coke not used by metallurgical industry.
[3] Includes light coal tar acids, alcohols, etc.
[4] Coking coal only.

Organic Chemicals

Units: Short tons

Industry	Beet Sugar	Other Natural Organic Chemicals	Synthetic Organic Chemicals
Petroleum Refining	.....	30	620
Agriculture	.....	.....	320
Mining, Milling, and Quarrying	.....	.....	9,300
Food	34,400	600	80
Other	.....	310	230
Total Consumed	34,400	940	10,550
Total Produced	220,000	1,880	9,000

• Davis Dam on the lower Colorado River will store 1,800,000 acre ft. of water in lake 67 miles long; provides 225,000 kva of power.

Congress May Authorize Needed Basic Study of West's Resources

By DR. J. R. MAHONEY
Senior Specialist
Natural Resources and Public Domain
Legislative Reference Service
Library of Congress
(On leave from Bureau of Business and Economic Research, University of Utah)

THE natural resource foundation of the Western states economy is richer and more varied than in any other section of the country. These Western resources are still largely unexplored.

Programs designed to establish a more complete and scientific foundation for the natural resources of the country and to shorten the period for completion of these essential studies will be considered by Congress early in 1950.

The effective use of the surface of the earth and its resources requires extensive and, for certain purposes, detailed knowledge of the physical and geologic character of the materials of which it is formed and of its topography. These physical characteristics are best portrayed on maps which show the variations in elevation and the geological characteristics of the materials forming the surface and subsurface structure of the earth.

Topographic maps on which contour lines (lines of equal elevation) showing surface characteristics and geologic maps showing both the basal hard-rock geology and the surficial characteristics of the accumulated weathered soil mantel are usually beyond the resources of any one type of map user. The actual and potential uses are numerous, but topographic and geologic mapping have been provided only in those areas where the United States Geological Survey, acting alone or in cooperation with states and other agencies, has carried on a mapping program.

Although topographic mapping has been carried on in a limited way for almost 100 years, only about 25 per cent of the area of the United States and Alaska is adequately covered with topographic maps, an additional 25 per cent being very poorly mapped.

While current needs are rapidly expanding, the rate of the present mapping program will require 60 years to cover the rest of the country. Geological maps on scales as large as one inch to the mile are available for only 10 per cent of the area of the United States. In the public-land states of the West, it is only half as much, and on the public domain, over which the United States has exclusive jurisdiction, the percentage is less than 5. For Alaska, 98 per cent of which is under federal jurisdiction, no more than 2 per cent of the area is adequately mapped. On the basis of the current program it will require from 60 to 75 years to complete the geologic mapping program.

The cadastral surveying of the public domain is far from complete. A total of 116,000,000 acres in the eleven Western states have not been surveyed. Probably as much as 50,000,000 acres that have been surveyed under the older programs will need to be re-surveyed, since the old markings have been lost and surveys are inadequate for present-day uses.

The location of the unsurveyed public domain is as follows:

Arizona	24,000,000 acres
California	16,000,000 acres
Colorado	2,000,000 acres
Idaho	9,000,000 acres
Montana	10,000,000 acres
Nevada	21,000,000 acres
New Mexico	10,000,000 acres
Oregon	5,000,000 acres
Utah	10,000,000 acres
Washington	6,000,000 acres
Wyoming	3,000,000 acres
Total	116,000,000 acres

A comprehensive program to provide these surveys and maps has been embodied in a bill that will be considered by Congress during the early part of the second session.

The objective of the bill as set forth in Section 2 is "to establish accelerated programs of topographic, geological, geodetic and hydrographic surveying and mapping of the United States, its territories and possessions and offshore areas, and the cadastral surveying of the public domain and other federal public lands, in order that suitable surveys and maps will be available" for the numerous uses for which these surveys and maps are needed within the shortest period of time consistent with the orderly recruiting of personnel and the effective scheduling of programs.

Fundamental Mapping

The bill establishes the responsibility of the Geological Survey for the completion of the topographic mapping of the United States within a period of 20 years, and the geologic mapping within a period of 30 years. It authorizes accelerated topographic and geologic mapping programs in Alaska and in other territories and possessions on a scale and scope sufficient to meet the needs for the effective development of resources and the orderly settlement of such territories and possessions. It also provides for geological mapping of submarine areas offshore from the United States, its territories and possessions as may be required for the effective and orderly development of the mineral and other resources.

Section 4 provides for the establishment of adequate geodetic control points and authorizes the Coast and Geodetic Survey to "provide surveys and charts with adequate submarine contours of offshore areas of the United States, its territories and possessions, at scheduled rates which will make suitable data available in time to meet the requirements for effective and orderly development of mineral, aquatic and other marine resources."

Section 5 of the bill provides for a 10-year program for the completion of the cadastral surveying of the public domain and "those parts of Alaska where surveys are most needed."

The inadequacy and fragmentary nature of the present basic data program may be characterized as follows:

1. No satisfactory determination has yet been made of the gross quantities of water available in each catchment or drainage basin. Precipitation is now recorded at a limited number of stations but these have been located with insufficient attention to the needs for reliable and adequate sampling of precipitation and other climatological phenomena.

2. No program has been formulated to convert available precipitation records into quantities of water that could serve as a beginning point for a systematic water resource accounting.

3. The volume of surface stream runoff is the only other phase of the hydrologic cycle for which quantitative data have been systematically collected. Stream measurements have, however, been restricted to the large rivers, their major subdivisions, and a few other streams.

4. Almost completely lacking are measurements or even identification of location and character of subsurface water movements and storage. The conditions of subsurface water flow and storage are infinitely more complex than surface flow and storage of water. Effective management requires extensive studies that generally have not yet been made.

5. The area of greatest deficiency in accumulated data and research in the hydrologic cycle is evapotranspiration, or the process of returning water to the atmosphere by transpiration through plants or in evaporation from water and land surfaces.

6. The failure to coordinate the efforts of the various agencies engaged in research and measurement of the various features of the hydrologic cycle is another fundamental weakness in the present basic data foundation of water resources.

Another program of great importance to the West is also ready for the consideration of Congress. This will establish a comprehensive program for the collection and analysis of the meterologic, hydrologic, geologic and other data required for a broad scientific foundation for the full development of the country's water resources.

Throughout the past 20 years there has been a rapidly growing realization on the part of the thinking public that fresh water is our most precious natural resource. This statement is equally true for the humid east as well as for the arid West.

Use of water for domestic, industrial, irrigation, and other needs has expanded to such a degree that many localities have reached the limit of economic development that can be sustained from existing water supplies: and unfortunately some areas have gone far beyond this limit, especially areas dependent upon ground water supplies. Some large metropolitan districts have already embarked on costly projects for importation of water from areas where the demand has not yet reached the limit of available supply, but some communities will find it impossible to augment their supplies and others actually face liquidation of part of their industry and population.

DR. J. R. MAHONEY

Federal construction and action programs for the development of the nation's water resources have now grown to very large proportions, actually utilizing greater appropriations than all other natural resources programs combined. The legislation proposed in this bill is designed to bring the federal basic-data program into harmony with the size and scope of the federal development program in water resources, especially the numerous construction and water management projects.

The logic and basic soundness of completing hydrologic studies, well in advance of project planning, would seem self-evident and overwhelming. The meager cost of these surveys in comparison with project costs would indicate that inertia and failure to visualize the real need accounts for the situation rather than the lack of funds for basic studies.

Objective of the bill as set forth in Section 2 is "to establish a comprehensive and adequate basic-data program in water resources and to provide for its maintenance in order that the full potential of the nation's water resources may be developed for all beneficial uses and that there may be adequate hydrologic and geologic data for the effective control, prevention, or reduction of the harmful or destructive powers of

water." To implement these broad objectives, the bill provides a complete and integrated program to replace the present fragmentary, inadequate, and uncoordinated program in this field.

All features of the hydrologic cycle are provided for, and the responsibilities are apportioned between the Weather Bureau and the Geological Survey on the basis of their customary line of functioning. Work now undertaken by the two agencies will be continued, but on a scale sufficient to fully accomplish the stated objectives, and their activities will be expanded to cover important features of the hydrologic cycle now neglected and other federal and state agencies will be brought into a full-scale program designed to meet all needs. Provisions are made for the research that may be needed to improve the processes of data-gathering and the development of a more complete understanding of the various forces and factors affecting the amounts and availability of water.

Cooperate With Other Agencies

The bill provides that the program shall include data and material originating with other federal and non-federal agencies or individuals when determined to be of acceptable standards and accuracy. It accords specific recognition to the important position and responsibilities of the states and local governments in basic data in water resources by providing for joint programs with these agencies and also with educational institutions.

A number of important provisions are made to integrate the extensive hydrologic research program of the federal government and to avoid unnecessary duplication by the Weather Bureau and the Geological Survey. Hydrologic and related research carried on by other federal departments and agencies (especially in the Department of Agriculture) as a necessary part of programs in soil and water resource control and management, in timber and crop production and in other activities involving the use and control of water resources which has general application and usefulness shall be utilized as far as may be practical, to meet the requirements of the program.

Industrial Expansion Program for Colorado Communities Launched

INDUSTRY and population are both concentrated in the northeastern section of this country. About 65 per cent of all U. S. manufacturing is concentrated in 9 per cent of the nation's area, in the northeastern part of the country. This includes New York, Baltimore, Boston, Philadelphia, and small manufacturing centers in New England.

In the West, by comparison, about 11 per cent of the nation's manufacturing is spread over 61 per cent of its area. It is significant to note that between 1940 and 1948 the Western states increased in population more than 33 per cent. Since population and industry factors are closely related, it follows that the increase in industry must become correspondent.

Industry in the east has reached the saturation point. More than half the New England states now have in excess of 10 per cent unemployed. By contrast, Colorado and the Rocky Mountain region figures run from 2 to 4 per cent.

Increase in unemployment during 1949 in other areas of the nation, and the growing realization of its implications, have led to efforts by Colorado Resources Development Council to take steps attempting of offset potential unemployment and, at the same time, directing industry in other areas interested in locating or relocating in the West to settle within Colorado.

CRDC has attempted to set up a community industrial expansion program in

By **Rolle Rand,** executive director of the Colorado Resources Development Council, Inc.

all cities and towns within Colorado. That such a program can be successful is exemplified by the results achieved in Colorado Springs, where 23 new industries have been established in the last 24 months. CRDC is seeking, on a proportionate scale, to assist the remainder of Colorado's communities to do as well.

The Council's industrial expansion program is novel in a sense that it is attempting on both an individual and a state level to integrate activity of this nature in such a fashion that the maximum results will be achieved with the minimum amount of effort.

The latter is important in that occasional small communities often are disinclined to bestir themselves in their own behalf because of imagined or actual obstacles.

Briefly, the first step in the program is for a representative of the CRDC to address in each community a representative gathering of leaders in the respective area. Those present are asked to set up within the area an industrial development committee made up of businessmen and representatives from local service clubs and the local chamber of commerce.

Second step is for the committee to make a survey of the community's resources, such as industries, available plant sites, labor supply, housing, power, water, schools, etc. It is pointed out that this can be done quite simply —usually on the intimate knowledge of the community which the members themselves automatically possess.

Attention is called to the information possessed by the local utility, railroads, newspapers, educational institutions, banks, attorneys and the like, who, of necessity, have much of this information. In addition, CRDC furnishes whatever information the community needs and does not at present have.

Third, once a list is made of the type of industry now in the community, the owners are contacted and asked what type of contracts they have had and now have. Meeting with the committee, the CRDC attempts to determine what type of contracts these same industries could use.

The Council then furnishes information on where and whom to contact in order to make the proper efforts to secure new contracts.

Fourth, with the foregoing information, the committee, with assistance of the Council, attempts to determine what type of new industry, just one, would prove an advantage to the community.

Once this is determined, the CRDC informs the committee where industries

of this type now are located in other sections of the country. The committee is told of the size of this type of industry, and figures are furnished pertinent to stability, estimated payroll, etc., of the particular concern.

Once this is known, the committee attempts to decide what advantages their community can offer this new industry. Would they do as Boulder, Colorado, did for Esquire Magazine and float a stock issue in the community to erect a building? Would they furnish a plant site as Colorado Springs has done for several industries? Would the community underwrite the cost of the move for the industry from outside the state to within Colorado?

Get Facts and Figures

Facts and figures are gathered pertinent to lower overhead, climate, more desirable labor, adequate housing, more beneficial recreation facilities, favorable tax structure, etc.

The committee then selects one or more of its members, and, with a representative of the CRDC, prepares to travel to the area in which the desired industry is located.

The owner or principal stockholders are contacted and attempts are made to convince them that it would be to their advantage to move to Colorado. Emphasis, of course, is placed upon the most desirable industrial location factors .

Though all claims are backed with appropriate accurate data, it is not the purpose of this program to secure just any industry. If the industry is a product of boom times and cannot survive through normal years, it follows that its failure would undoubtedly be a liability to the community and therefore to the state.

Help on Contracts

An attempt to interest a particular new industry toward locating in a specific area is done with the paramount thought that it is as much to the industry's advantage to move to the community as it is for the community to have it.

As an adjunct of the foregoing program, the CRDC also seeks to assist Colorado businessmen in all of Colorado's 63 counties in procedures and methods to be followed in order to secure government contracts or subcontracts.

In the past, lack of knowledge as to how to secure government contracts has prevented Colorado industries from getting their just share of federal business.

CRDC has furnished information and is continuing to do so to Colorado businesses on how local concerns can sell their surplus products abroad under the Marshall Plan.

The council furnished information on the names and addresses of all military procurement agencies in the United States and the types of items they need; and all information on foreign purchasing commissions and their addresses throughout the world.

The program already has begun to bear fruit. At a meeting in Sterling, Colorado, representatives of seven Colorado communities met and discussed plans for the expansion or addition of many industries.

Included were: seed cleaning and treating, alfalfa dehydrating, soy bean processing, starch processing, manufacture of paper from surplus straw, a manufacturing creamery, a processing plant for surplus potatoes, potato chips and canned potatoes, safflower processing, food dehydration and canning, flour milling, and the development of handcraft industry.

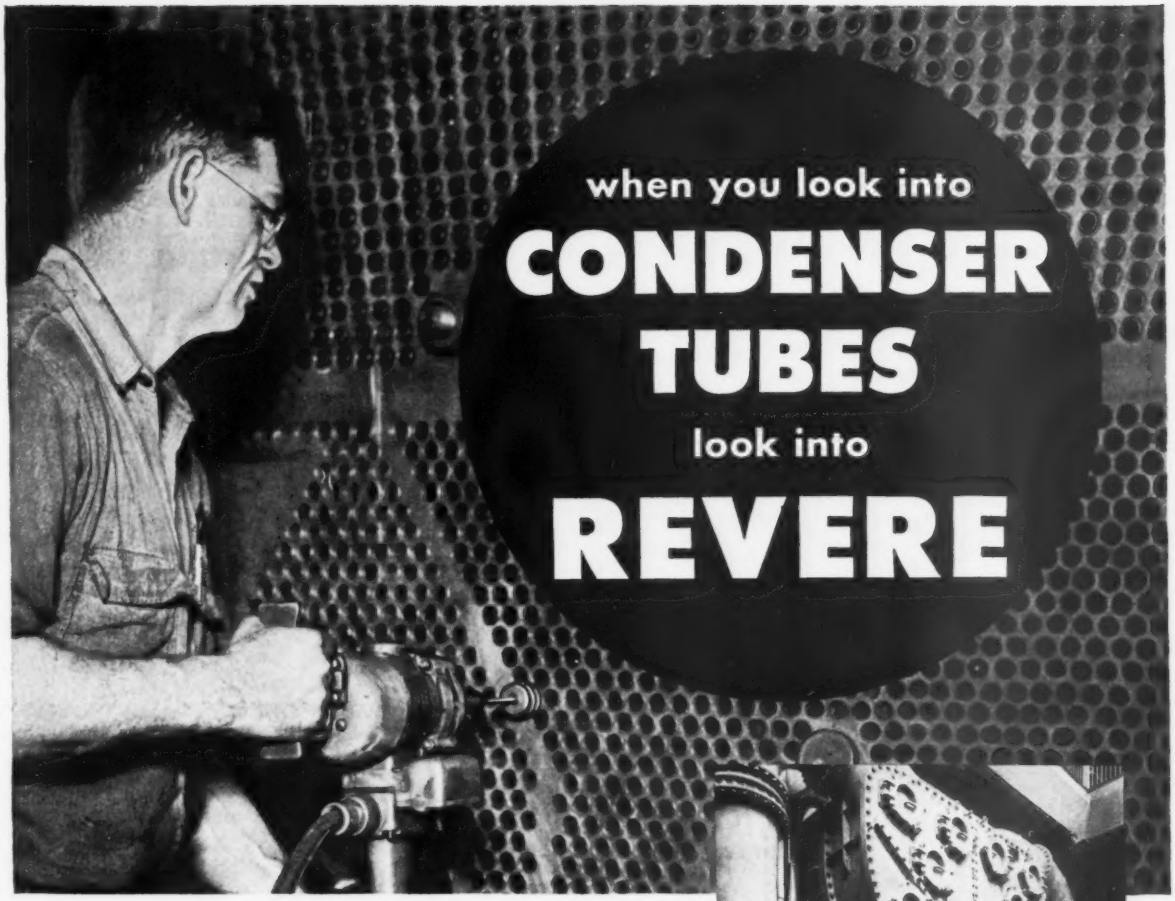
Other items discussed included further study for obtaining a reduction and equalization in freight rates, low-cost power, lower cost fuels, and the securing of complete information which would be of interest to a prospective manufacturer in the area.

Results Already

A committee was set up and already preliminary studies by the CRDC indicate that the area will benefit from several new plants of the aforementioned types.

As it now stands, these communities who, collectively, are the state of Colorado, realize what tools are necessary in order to get the job done. Knowing this, their attitude may be summed up in four words: "Let's Get to Work." This is the pioneer spirit, as applicable in 1950 as it was 100 years ago.

Colorado's mining resources offer untouched opportunities. Climax Molybdenum's big mine at the crest of the Continental Divide handles 6,000 tons daily of flotation mill tailings through this spiral concentrator for the recovery of tungsten concentrate.



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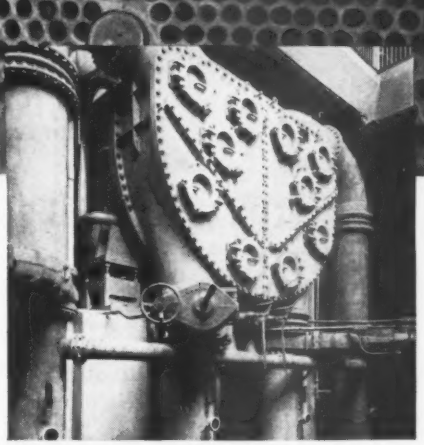
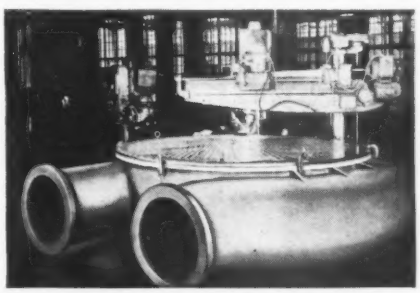


View of condenser built by the Elliott Co. for the Mad River Station of the Ohio Edison Co., Springfield, Ohio. It is an 18,200 sq. ft. two-pass divided water-box type, equipped with 3480 1" O.D. x #18 B.W.G. x 20' 3" long Arsenical Admiralty Revere Tubes.



TUBE PLATE OF REVERE MUNTZ METAL for an 11,000 sq. ft. surface condenser, to be installed for a Texas utility, being drilled in the shops of the Elliott Co., at Jeannette, Pa.

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Leavenworth, Kan.
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Los Angeles, Cal.
Lubbock, Tex.
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Milwaukee, Wis.
Minneapolis, Minn.
Monterrey, Mex.
New Orleans, La.
New York City, N. Y.
Oakland, Cal.
Oklahoma City, Okla.
Peoria, Ill.
Philadelphia, Pa.
Phoenix, Ariz.
Pittsburgh, Pa.
Portland, Ore.
Pueblo, Colo.
St. Joseph, Mo.
St. Louis, Mo.
Sacramento, Cal.
Salt Lake City, Utah
San Angelo, Tex.
San Antonio, Tex.
San Bernardino, Cal.
San Diego, Cal.
San Francisco, Cal.
San Jose, Cal.
Santa Barbara, Cal.
Santa Rosa, Cal.
Seattle, Wash.
Stockton, Cal.
Temple, Tex.
Topeka, Kans.
Tulsa, Okla.
Washington, D. C.
Wichita, Kans.
Wichita Falls, Tex.

Western Electroplating Industry Expands

By ELBURN MARCUM
Technical Service Representative
Sodium Products Division
E. I. Du Pont de Nemours & Co.

WEST COAST manufacturers and job platers emerged from the war both wiser and better equipped to cope with the peaceful commercial world. They were armed with skill, initiative, and modern plants, and geared for mass production.

Conversion of war plants to domestic production furnished the quantity of materials necessary to keep the plating plants in operation.

To gain an idea of the expansion and shift of this industry to modern methods, the increase in gallons of plating solution used might be taken as an index. Using figures of the du Pont Corp. to establish this index (and they are only one of the suppliers of such solutions) we find:

1946 consumption of plating solution was 180 per cent of that in 1945;
1947 consumption of plating solution was 290 per cent of that in 1945;
1948 consumption of plating solution was 350 per cent of that in 1945.

Much Modernization

These figures in themselves offer proof of the modernization that has taken place in the past four years.

There are approximately 660,000 gallons of plating solution in the eleven Western states. 501,000 gallons, or 76%, are of the most modern types of solutions. 12% are such solutions as dull nickel and duplex copper, used where they are more adaptable than the so-called modern type.

A break-down of this total to determine the amount of various plating baths according to metals used, shows 33% in nickel, 23% in copper, 21% in chrome, 12% in zinc, 8% in cadmium, 2% in brass and bronze, and 1% divided between tin, gold, and silver.

Distribution break-down shows that 74% of the plating solution gallonage goes to southern California; 20% goes to the San Francisco Bay area; and the remaining 6% goes to the northwest and remaining areas in the eleven Western states.

In that area there are approximately 1,260 plants engaged in electroplating or related departments, with 1,082 of them in California, according to the 1949 market map of "Metal Finishing."

(Continued on page 80)

Miscellaneous Products

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
Meat Packing, Wholesale					
Colorado	32	3,231	2,686	$15,786	$1,771
Arizona	18	530	445	2,049	77
Utah	23	750	594	3,753	512
Total Mtn.	73	4,511	3,725	21,588	2,360
Washington	62	2,468	1,977	13,092	1,076
Oregon	32	1,210	910	5,511	834
California	133	10,353	7,969	51,240	5,207
Total Pacific	227	14,031	10,856	69,843	7,117
Total Western	300	18,542	14,581	91,431	9,477
Poultry Dressing, Wholesale					
Washington	15	354	326	$1,491	$4
Oregon	16	553	474	2,560	140
California	39	927	828	3,374	380
Total Pacific	70	1,834	1,628	7,425	524
Confectionery and Related Products					
California	173	5,260	4,283	$28,687	$2,048
Confectionery Products					
Colorado	16	472	349	$1,784	$41
Utah	15	724	630	4,116	123
Total Mtn.	31	1,196	979	5,900	164
California	166	5,010	4,084	25,616	1,917
Total Western	197	6,206	5,063	31,516	2,081
Chocolate and Cocoa Products					
California	3	183	138	$2,602	$95
Instruments and Related Products					
Montana	1	**	**	**	**
Idaho	2	**	**	**	**
Colorado	18	360	282	$1,737	$85
New Mexico	1	**	**	**	**
Arizona	4	6	6	35	**
Utah	4	27	24	94	.....
Nevada	**	**	**	**	**
Total Mtn.	30	393	312	1,866	85
Washington	18	96	73	**	**
Oregon	11	**	**	**	**
California	257	6,776	5,298	**	**
Total Pacific	286	6,872	5,371	.....	.....
Total Western	316	7,265	5,683	1,866	85
Mechanical Measuring Instruments					
California	42	2,926	2,313	$12,031	$760
Medical Instruments and Supplies					
California	85	668	502	$3,545	$102
Surgical Appliances and Supplies					
California	54	468	352	$1,964	$68
Photographic Equipment					
California	67	1,229	962	$5,980	$536
Vegetable and Animal Oils					
Arizona	8	237	206	$2,889	$90
Washington	24	271	224	3,120	288
Oregon	11	178	146	3,197	160
California	70	2,693	2,233	46,600	3,682
Total Pacific	105	3,142	2,603	52,917	4,130
Total Western	113	3,379	2,809	58,695	4,220
Cottonseed Oil Mills					
California	7	529	427	$8,825	$801
Marine Animal Oils					
California	9	182	162	$873	$145
Grease and Tallow					
California	33	857	773	$9,388	$879
Soap and Related Products					
California	124	2,860	1,698	$40,639	$2,749
Costume Jewelry and Notions					
California	65	589	513	$2,252	$83
Costume Jewelry					
California	32	234	210	$868	$47

** Withheld to avoid disclosing figures for individual companies.

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ELECTROPLATING

(Continued from page 78)

The 1949 Hand Book of the Los Angeles Branch of American Electroplaters Society lists only 350 plants on the West Coast who are actively engaged in plating. Of these, 250 are job shops and 100 are manufacturers. This indicates that job shop operations constitute a large portion of plating activity.

It is estimated that these job plating plants gross approximately $7,000,000 annually, based on present business.

Two Classes of Shops

In general, job shop activities are divided into two classes. First and more important is metal finishing of production work from manufacturers. Second (and although less important it is still a necessary operation), is the refinishing of used materials. This latter is usually a smaller operation, involving only one or a few items from any given customer, and is an "over the counter" business.

To give a clear picture of the work done by job shops would be as difficult as to describe all the shades of color in the spectrum. One job shop owner indicates that he has more than 1,000 customers (manufacturers) on his active list, most of whom furnish many different items for metal finishing.

These items - to - be - plated run the gamut of industrial production from ball point pens to builders' hardware, including a host of unidentifiable items. The amount of each item may vary from a few to many thousands, or from a few pounds to several tons, depending upon the item.

In a typical job shop, the list of items plated today would have to be almost completely revised within a few days.

Some plants are not set up to handle such a variety of work, but may specialize in certain fields, such as plating zinc die castings and brass castings in large quantity on automatic machines. In this type of plant, it is uneconomical to operate unless like parts number in the tens of thousands.

This type of plant contributes largely to a desirable overall competitive market for the products, since a large amount may be finished at a minimum cost.

In contrast, other shops of importance do a great variety of work but they are geared to handle smaller quantities of any given item. This means that a manufacturer may produce in any quantity and find a job plating plant with equipment geared to handle that quantity efficiently, and at a minimum cost.

Plating Departments

Manufacturers who do their own plating engage in that activity only when they have sufficient volume to maintain such a department. Since many of these manufacturers produce a limited number of items but a large volume, the work is easily adapted to full automatic or semi-automatic operations, which is the most economical procedure for them.

Schlage Lock Co., San Francisco, Hilgren Mfg. Co. and Kwikset Lock Co., Los Angeles, are examples of such manufacturers of builders' hardware.

Hall-Mack Co., Los Angeles, reported to be the world's largest manufacturers of bathroom fixtures, have developed their plating techniques to a point where they are competitive with eastern manufacturers in an eastern market.

In the plumbing fixture field, considerable local competition has furnished the incentive to improve technique and reduce cost so that some plants can now ship east and give eastern manufacturers considerable competition on their home ground.

Door Knob Specialists

Gross business done by manufacturers of builders' hardware other than locks, plumbing, and bathroom fixtures totals well over $1,500,000 per year.

One plant specializes in manufacturing door knobs. This company's greatest volume of sales is east of the Mississippi.

And so it goes, down through such important industrial fields as automobile parts and accessories, electrical equipment, ranges and refrigerators, and the novelty and trophy field, as well as household items, wire goods, and industrial and professional equipment.

One thing is common to all successful and progressive plants, either job shops or manufacturers who do plating operations. They maintain close chemical control of their plating solutions in order to assure maximum efficiency and economy of operation. This is done either by their own or an outside laboratory.

As long as the present general attitude toward improvement is maintained by those engaged in electroplating activities in the West, the West will continue to make progress both as to the quantity of materials produced as well as quality.

(Figures from 1947 U. S. Census of Manufactures. Money figures in thousands of dollars.)

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
Ships and Boats					
California	117	18,289	16,497	$73,194	$764
Ship Building and Repairing					
California	31	17,042	15,375	$67,147	$694
Boat Building and Repairing					
Washington	67	619	559	$2,147	$98
Oregon	18	151	138	614	32
California	86	1,247	1,122	6,047	70
Total Pacific	171	2,017	1,819	8,808	200
Motor Vehicles and Equipment					
Washington	33	1,567	1,293	$6,973	$316
California	242	16,429	13,579	126,340	16,126
Total Pacific	275	17,996	14,872	133,313	16,442
Motor Vehicles and Parts					
California	108	12,118	9,921	$97,509	$14,408
Truck and Bus Bodies					
California	51	1,315	1,149	$7,916	$555
Truck Trailers					
Oregon	7	318	266	$1,631	$274
California	24	1,305	1,017	10,839	507
Total Pacific	31	1,623	1,283	12,470	781
Automobile Trailers					
California	59	1,691	1,492	$10,076	$656

** Withheld to avoid disclosing figures for individual companies.

	Total number of establishments	All Employes Number (average for year)	Product'n Workers Number (average for 1947)	Value added by manufacture	Expenditures for new plant & equipment
Manufactured Ice					
Colorado	20	360	246	$1,470	$275
Arizona	26	840	557	3,895	870
Total Mtn.	46	1,200	803	5,365	1,145
Washington	25	391	329	1,884	137
Oregon	19	245	200	1,576	284
California	189	4,702	2,863	25,115	2,919
Total Pacific	233	6,538	4,195	33,940	4,485
Total Western	279	7,738	4,998	39,305	8,970
Compressed and Liquefied Gases					
Colorado	4	108	44	$1,081	$139
Washington	9	176	473	287	**
Oregon	8	150	447	215	**
California	33	996	3,009	1,864	2,316
Total Pacific	50	1,322	3,929	2,366	2,316
Total Western	54	1,430	4,257	2,496	2,455
Toilet Preparations					
California	59	1,269	909	$9,675	$1,297
Photoengraving					
Washington	10	135	83	$972	$23
California	74	1,123	837	8,285	290
Total Pacific	84	1,258	920	9,257	313

** Withheld to avoid disclosing figures for individual companies.

LABOR and the INDUSTRIAL WEST

By J. B. FITZGERALD
Western Industry's
Labor Relations Analyst

(Formerly Manager, Lumbermen's Industrial Relations Committee, Inc., Portland, Oregon)

How to Take the Wool From Your Eyes and Plan a Good Pension

NEWS about pensions for employees came upon Western industrial employers with the suddenness and full shock of their first wild-cat strike. Last evening everything was normal; today's news out of the East tells of pension demands on the steel industry leading to strike—a big one—and hell's to pay.

So, the average Western employer, who has a payroll of somewhere from 20 to 40 people, gets mad at the unions, and if he is a discriminating fellow, good and angry also at the national administration.

His first reaction is: "To hell with them!" He's not going to do anything more for such people; all they know is more, more, more! He's all through! Pensions! And he to pay for them! That's the last straw they're going to try to load on his financial back! He'll close her up and quit!

Yet, past experience clearly indicates that in some way or another, he will wind up by trying to satisfy this union-administration backed urge for security. He has accepted many distasteful things in labor relations in the past, because some of his local competitors took them on.

Now, at the mercy of a powerful public opinion, created by acceptance of the theory and practice of pensions by the largest industry in the United States, this average employer is in a bad way.

Pensions, unlike some other benefits, are expensive. A sound program must be planned ahead for a long, long time, even perhaps to the second and third generation. Vacations, pay for work not done and so on, can always be considered as temporary. Some time when things get tough enough, these may wither away.

But pensions, once launched, because of their very nature, will probably be with this average manufacturer or processor during the life of the business.

What can he do? Usually, a small employer can convince his crew of his inability to undertake a contract of this kind. He is close to his crew and can talk with them in their own language.

Progress or Quit

Literally, thousands of employers of average employment size and under, just cannot afford pensions; their choice may be between operating or closing down. This group of employers, whether negotiating singly or in a group, should start explaining their own situations at the earliest possible moment to their employees.

By all means they should familiarize themselves with pension costs, so they can talk intelligently either to the employees or to their union representatives in a factual manner.

But such employers should not wait to talk until after their people become inflamed with the idea of getting free pensions. Employees minds will be hard to change then. In any case, employers of all size employments should not go too rapidly toward accepting pensions.

The present pension movement is a CIO program, backed by the national administration. AFL is not particularly interested, their leaders say, although there may be some local deviations here and there.

National AFL leaders would rather, they have stated, let the federal govern-

(Continued on next page)

• These men are speakers at a recent industrial human relations clinic held in Arizona by management and labor from five utility firms. Left to right: Alfred Shackleford, Tucson, representative of the International Brotherhood of Electrical Workers; Henry B. Sargent, president of Central Arizona Light and Power Company; W. L. Ingram, vice president of I.B.E.W.; Reid Gardner, Phoenix, president of Arizona Edison Company.

ment take care of all industrial and business pensions, through payroll deductions from employers and employees.

Someone Should Care—

So many of their people are employed by many small employers throughout their lifetime—building trades, teamsters and many more—that it seems to them some central agency must be given the power and the cash to take care of those who work regularly and live to be of pension age.

Most American employees of industry and business, where interstate commerce is at all involved, are covered by federal old-age retirement insurance. That is providing currently around $25.00 monthly to the average retired person and about $50.00 to those who paid in the full period on $3,000 yearly earnings.

In Congress before the last adjournment, the House passed a bill to increase all pension payments some 70 per cent, but this has not yet been passed by the Senate.

Both Unions Push

Both unions—CIO and AFL—will be back of this bill when Congress meets again in January. Should Congress so increase federal retirement pensions, CIO will undoubtedly increase its current demands to have employers pay the difference between the new figures and something around $140 monthly for each employee.

One amazing thing about the present pension drive was the lack of information coming to Western employers while the program was being discussed early in the day, some 12 to 18 months ago.

Things Have Changed

Time was when wage and other changes in the East dealing with labor had little influence in the West. That was before the advent of the CIO and the power politically of that organization within high places in Washington. Today, and for several years, the labor relations medicine brewed by these "selfish interests," once forced on employers in the East, becomes the cure-all for all employers and employees West to the Pacific Ocean.

Wage and other differentials largely have disappeared throughout the North, East, and West. It would seem time for Western employers to consider this new alignment and take such measures as will best protect their own interests.

In the West, the average unit of employment is much smaller than in the East. Factories and processing plants are scattered over a wide territory instead of being in a series of centers of population as in the East and Mid-west.

East vs. West

Social accommodations between employers, superintendents and foremen are a normal way of life in hundreds of Western communities; they are unknown in large crowded industrial areas in the East.

These advantages of the employer in this area are real, but they carry also certain disadvantages. One of these is the lack of overall employer grouping for study of labor relations in the area.

Almost every city along the Coast and in the territory to the Rocky Mountains is the location of a number of employer labor relations associations. Many communities have several. In the San Francisco Bay area most of the labor relations associations serving employers work together in matters of information and research. This of course is what the unions have been doing for many years. This has proven to be a most profitable association over the years.

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In thinking about pensions and from them to other costly items which may come to bother the Western employer, it would seem a prime need would be to establish a central research and information agency. Such an agency should be supported by employers, either through their present associations, or where not members, in cooperation with them. They should analyze current and probable future problems, as foreseen by the agency and have these ready for use by all employers in the area when the need arises.

A Western Need

Most Western employer associations are not equipped to do this. If they were so organized, each would probably cost nearly as much as the central agency. What can be done in this connection was demonstrated last winter.

A thorough pension research job, including other welfare programs wanted by the CIO national leaders, was prepared by the Research Department of the San Francisco Employers Council. This is probably the only unit in the Western territory staffed and equipped to do a task of this kind for employers.

A paper, based on this research, entitled, "The Outlook For Collective Bargaining on Welfare and Pension Plans," was given by William H. Smith, Research Director of the association, before the Conference of Western States Employers Associations, at Los Angeles, February 19, 1949.

This paper covered reasons for pension demands which had welled up during the previous year, among the leaders of the CIO. These demands were probably based on success of the mine workers, under John L. Lewis.

Status of steel negotiations on pensions and other benefits, their costs, and so on were included in the paper. All told, this study is still of great value to any employer who wants to know the score on pensions and social welfare items for employees. It is a well organized, well prepared exposition.

The point here is that it was not arranged previously that a copy of a study such as this should have gone to every organized employer in the West, from his own association dealing in his labor relations. This one did—with a recommendation that he and his staff make a thorough study of its contents. He was urged to discuss its points with other employers and see that this expensive item be thoroughly understood by all who might one day be called upon to pay for its keep.

A Western research organization serving employers, through their asso-

(Continued on page 85)

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GENERAL WAGE CHANGES IN PACIFIC-ROCKY MOUNTAIN REGION

NOTE: This tabulation only reports changes. Information on the large number of contracts renewed without change is unavailable. Therefore the tabulation should not be construed as an indication of the overall trend.

Compiled from various sources by Bureau of Labor Statistics, Wage Analysis Branch
(Where initials of unions are given below: A=AF of L; C=CIO; I=Independent)

CALIFORNIA	Location	Date	Amount of Increase	Number of Workers	Other Economic Benefits
Wholesale Trade					
Santa Clara Co. Milk Driv.	San Jose	6/13	12½c	IAM—I—50	Retro. 6/1/49
Plumbing & Hardware Dealers Assn.	San Diego	6/13	(1) $10 per mo. (2) $5 per mo.	TCWH—A—100	(1) Steelyard empl. (2) All others
4 large cold storage co's	Los Angeles	6/7/49	5-8c	TCWH—A—124	Retro. 6/1/49
Pacific Coast Iron Pipe & Fittings	Los Angeles	7/27	5½c	USA—C—61	Retro. 7/1/49
5 battery companies	Los Angeles	6/20	5c	IAM—I—60	Retro. 5/1/49
Southwest Rolling Mills	Maywood	7/49	14c	USA—C	Imp. vaca. and seniority program
Eldon Mfg. Co.	Los Angeles	5/49	5c	MMSW—C—250	
Transportation					
Mission, Yellow, United & G.I. cabs	San Jose	6/15/49	$3 weekly	TCWH—A—75	Optional 2% incr. in com. share of fares
Los Angeles Transit Lines	Los Angeles	6/1/49	4 cents	SERMCE—A 3500	Add. 1c if BLS C.P.I. rises 1.2 pts.
Draymen's Assn.	Oakland	6/49	50c day	TCWH—A—2000	
Truck Owners Ass'n of Cal.	San Francisco	7/15	8c	TCWH—A—85	Retro. 6/1/49
Chemicals, Allied Products					
W. P. Fuller Co.	San Francisco	7/16	2½c	IAM—I—20	Retro. 5/15/49
Eldorado Oil Works	Oakland	7/1	$10 per mo.	OUPWA—C Chemists	
Food Processing					
Bishop & Co.	Los Angeles	7/22	5c	BCW—A—120	Retro. 5/1/49
Union Ice Co.	Firebaugh	7/11	5½c	IUCE—A—15	Retro. 4/1/49
Kraft Food Co.	Los Angeles	6/22	(1) 10c (2) 7½c	TCWH—84	(1) Warehousemen (2) Produce workers

CORRECTION: In the November issue of *Western Industry* it was erroneously reported that a contract between Peerless Pump division of Food Machinery Co. and IAM showed an increase of 8c per hour effective June 20. That contract did not change the wage structure of the firm, which has been in existence since May 17, 1948.

COLORADO					
Metal Working					
Chicago Freight Car & Parts Co.	Pueblo	9/49	*10c	USA—C	*Retro. 5/1/49
General Iron Works	Englewood	9/49	*7½c	OEIU—A—45	*Retro. 8/20/49
Gardner Denver Co.	Denver	8/49	None	40	Class. adj. eff. 8/1/49
Food and Food Processing					
Great Western Sugar Co. (18 plants)	Colo., Mont., Wyo. & Neb.	8/1	None	FLU—A 800-4,000 (seasonal)	5-day wk., except sugar proc. time. 2 wks. vac. 1 yr., 3 wks. after 25 yrs.
Holly Sugar Corp. (6 plants)	Colo., Mont. and Wyo.	8/49	None	FLU—A—700	Add. vac. benefits.
NEW MEXICO					
Lumber and Products					
Lavender Tie & Lumber Co.	Wagon Mound	8/17	15c		
UTAH					
Miscellaneous Manufacturing					
Kennecott Copper Corp.	Bingham and Magna, Utah	7/1	None	IBEW—A 200	
U. S. Smelting, Refining and Mining Co.	Bingham, Lark & Midvale, Utah, and Pioche, Nevada	7/49	None	PMWC—C 1,300	
WASHINGTON					
Transportation					
Northwest Greyhound Lines	Seattle	7/7	8.5%	SERMCE—A 215 drivers and shop workers	
37 Allied Truckers, Inc.	Tacoma	7/22	*7c	250 drivers	*Retro. 5/1/49; imp. vac. & 1 pd. hol.
Services					
Cold Storage Houses (6)	Washington & Oregon	7/25	7½c	IUOE—A—60	

(Continued from page 83)

ciations (or on an individual basis for those not members of any employers' industrial relation association) could put the same facts, ideas and arguments on the desk of every contributing employer on any problem of consequence in the labor relations field and have it there ready for study before it was needed.

More Angles to It

At the moment there are a number of angles within the pension and welfare programs of the unions on which detailed light might be thrown for the information of the average employer.

An average employee in a young organization, for example, would, according to insurance experts, rather have a combination of life, accident, health, medical care and hospital insurance than a pension program. And he would be usually willing to pay up to one-half of the costs for himself and all the costs to have his family also covered.

This, with the cost shared by the crew, is not expensive; yet it is a highly satisfactory deal to the employee.

If the average employee is over 40, and if he has been on the job a long time, say 15 years, his thoughts will naturally run to pensions. But, usually, not the younger people.

A program of this kind can be gotten from any old line insurance company. Any good negotiator can sell it in preference to a pension plan to a crew that does not have its collective mind made up by someone in power.

Insurance people figure that less than 10 per cent of the crew will be on hand to collect pensions. That same crew, with all its turn-over, will get plenty of satisfaction from a modified social-security deal as outlined here.

Present agitation for pensions, plus other social benefits result from decisions of the National Labor Relations Board. There is movement on hand to persuade Congress to provide that negotiations on pensions be opened only in a labor-management agreement, upon the initiative of the employer, or that pensions be made not a matter of collective bargaining.

The yes and no side of this proposition would well be covered by a research organization. So could the problem of private versus government handling of pensions. A case can be made either way.

And it appears that the majority of employers, because they are small would benefit most (or suffer least) from an increase in social security rates to pay proper basic pensions to all workers covered.

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Pensions Dominate Labor Plans; Federal Workers Get Raises

AFTER lagging behind all major industries, excepting textile, throughout the year in wage increases, metalworking suddenly went to the top, and nearly all by itself, in accepting employer-paid pensions.

This sudden spurt, the result of CIO and government connivance and cooperation, makes the outstanding showing for the month ending November 1, in the report of the Bureau of Labor Statistics of the U. S. Department of Labor, entitled, "Current Wage Developments." With these pensions also, went jointly-paid fairly standard packages of employee welfare insurance.

The Bureau report states that "Prior to the Bethlehem settlement," (announced on October 31) "about 40 smaller steel producing or fabricating companies, employing more than 50,000 workers, had agreed to accept the 6-cent pension and 4-cent insurance package derived from the Steel Board's report.

"The Bethlehem Steel Corporation agreement," the report continues, "with CIO Steelworkers 'set up' (1) a substantial increase in benefits under the company's long-established non-contributory pension plan and (2) the establishment of a jointly-financed social insurance program. Over 75,000 employers were affected."

The new plan, according to reports coming to the Bureau, "provides a minimum of $100 per month, including Social Security old age benefits, at 64, after 25 years of service. (Former minimum, $50). Reduced annuities are provided for employees with less than 25 years but more than 15 years of service.

"Pensions above the $100 minimum will be computed according to a slightly revised formula; 1 per cent of average monthly earnings over the past 10 years, multiplied by the number of years of service, plus Social Security benefits. The cost of pensions to the company, estimated by the union as nearly 12 cents an hour under the revised plan, will be reduced if benefits are raised.

"The new social insurance plan calls for joint contributions from company and employees of 2½ cents each per hour worked. Formerly, the employees contributed 1¼ cents per hour; the company generally bore only the administrative expenses. The 5-cents an hour contribution under the new plan is expected to provide family coverage, hospitalization, more life insurance and larger sickness and accident benefits."

Steel, while the major mover, was not the only industry to accept pensions. Some others did. Notable were the Goodyear Tire and Rubber on a 10-cent per hour deal with the United Rubber Workers CIO, and the New York City milk processors and distributors, who accepted a 6- and 4-cent arrangement on pensions and welfare insurance with the Teamsters' Union, AFL, covering some 15,000 workers.

"The Radio Corporation of America," the report continues, "with several unions representing 17,000 workers in nine plants, negotiated settlements," in September and October. In three eastern plants and one at Hollywood, Calif., a 3½ cent increase was obtained with a seventh paid holiday, by the CIO United Electric Workers. Also the company "assumed full cost of the life insurance plan (formerly paid 60 per cent) and instituted a noncontributory hospitalization and surgical benefit plan for employees only. In Camden and Hollywood the company assumed the

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employees' State tax for sickness and accident insurance (¾ of 1 per cent). . . . Added vacation pay for employees with 6 to 10 years of service was granted," also. "No change was made in the RCA contributory pension program."

Contributory social insurance programs were announced in *Western Industry* last month by agreement between the Pacific Maritime Association and the Pacific Coast longshoremen, both CIO and AFL. "On the East Coast," the Bureau reports, "a two-year agreement covering approximately 60,000 members of the International Longshoremen's Assn., AFL, in major ports sets up a pension fund financed by employer contributions of 5 cents a man-hour, and increases employer contributions to existing noncontributory welfare insurance fund from 2½ cents to 3¾ cents to finance family hospitalization coverage. The contract provides for a wage review around September 30, 1950."

"Congress provided salary increases in October for almost 3,000,000 Federal employees, including members of the armed forces. The average increase for classified employees was reported as approximately $141 per year. . . . Classified employees had received postwar increases of 14 per cent in 1946 and $330 a year in 1948."

By industries:

Food

This classification of employers, during the entire year has been reported as increasing wages and employee benefits. Of 33 reported, 28 increased wages, six did not. The largest employer, Swift & Co., with 45 plants and 42,000 employees, adjusted wages from 0 to 15 cents per hour by increasing differentials between job classes; and adding to geographical differences. The National Biscuit Co., with 22 plants in 13 states, employing 14,000 people, installed a company-paid health and welfare fund (to cost around 3 cents per hour) and agreed to discuss pensions during the contract year. Already has contributory life insurance plan.

Textiles

Sixteen firms, four increased wages, two 5 cents per hour, one 10 cents, one 15 cents. One of these restored 10 cent cut made June 20, 1949.

Apparel

Six bargaining units, five of them associations. Employment some 13,000. No wage increases but each added something, including, one, retirement fund at 1 per cent of payroll; one, departmental adjustments; two, company paid health and welfare insurance; and another added vacation and holiday pay.

Paper

Twenty-four firms and groups, 19 no wage changes and five with increases ranging from 4 to 5½ cents. Fourteen, however, accepted some added employee benefits, one company paid pensions; eight, social welfare programs; some contributory, others added paid holidays, new vacation plan, or added vacation benefits.

Chemicals

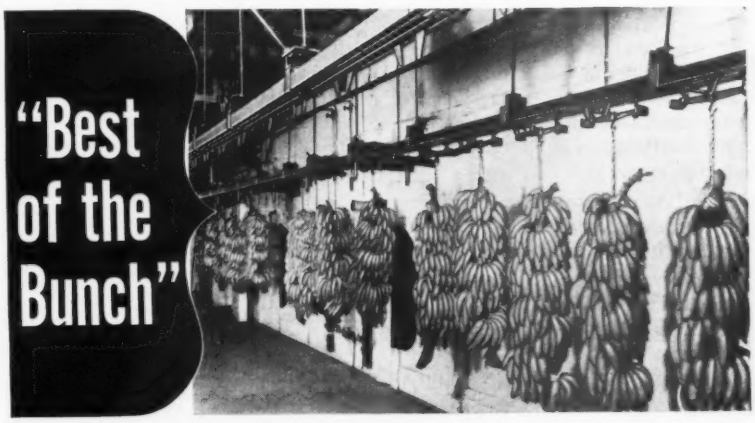
Seventeen employers, five no wage change, 12 raised from 1½ cents (cost of living allowance) to 7 cents. Two added paid holidays; three added vacations, one of these agreed to contribute 15 cents per man hour for pensions, employees contribution to be determined. Two added social welfare insurance—one company-paid, one contributory.

Petroleum

Three employers, none large. Two no wage changes, two bettered vacations, one also sick pay. The other added 5 cents an hour and two more holidays.

Rubber

Goodyear Tire and Rubber Co., with 10 plants and 22,000 employees, agreed tentatively to extend contributory pension and insurance plans up to company cost of 10 cents per hour. Three others, one no change, one company paid Blue Cross plan, the other to reopen clause on insurance and pensions.



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New Features Developed in Steam-Electric Plants

"Outdoor type" of design obviates need for special housing; as hydro costs advance, greater steam efficiencies are discovered

LOS ANGELES—Near-completion, by the eight power systems serving southern California industry, of their big post-war expansion program, reveals some interesting new technical developments pioneered by Western engineers.

It also underscores a significant change in this area's basic power picture, hinting of higher costs ahead.

For several decades, long-distance transmission lines have tapped the vast water resources of the high Sierra, bringing low-cost electricity and easily keeping pace with the growing industrial needs of southern California.

Before the war, about 67 per cent of the electricity consumed here was from hydro sources and only 33 per cent from steam.

But easier sites for dams have been developed. Now diminishing returns are setting in. Steam power, formerly used mainly for stand-by reserve for peak periods and in drouth years, is figuring importantly in the new power program.

Trend of the Times

The proportion of steam-generated power has risen to nearly 50 per cent and the percentage of hydro power has dropped correspondingly.

Sharp post war advances in petroleum prices for a time threatened further upset to established practices, and the new steam plants were equipped with facilities to permit use of coal if necessary.

But now the fuel market has reverted to the normal prewar condition, and a three-fold growth of inventories of heavy residual oils during the past two years has served to stabilize prices and encourage the trend toward steam power.

Departing from eastern methods of design, the new municipal plants at Burbank and Glendale and Southern California Edison's Redondo station are of an "outdoor" type, thanks to the mild climate which obviates need of special housing for boiler, air preheaters, fans, and oil heaters.

Special Methods

Special operating methods include: (1) use of high-pressure mechanical oil atomization to break down the heavy oil used as fuel, reducing smoke; (2) successful control of marine fouling organisms by regulating temperature of the sea water used in the cooling system; (3) new electrical controls which at Redondo, for example, permit the load to jump from five per cent to full capacity in 15 seconds.

An Example

As an example of why hydro development costs are high now and going higher, engineers of the Southern California Edison have had to move a mountain river to build another dam and hydro-electric plant at the Edison Big Creek-San Joaquin River Development in the High Sierra.

An 847-foot diversion tunnel was necessary to shift the San Jaoquin River bodily while workmen laid foundations for the barrier that will rise 228 feet high and 954 feet long across the canyon. The $20,000,000 project, scheduled for completion in 1951, will add two 42,000-k.w. generating units to the Big Creek system, which today consists of five powerhouses with 16 generating units, three major lakes created by construction of six dams, and eight tunnels through the mountains to supply in turn the various powerhouses.

Lest the implications of this trend toward higher power production sound too alarming, it should be remembered that economic factors, coupled with recent technical developments in ultra-long distance power transmission, could vastly broaden the regional power pools that helped keep Western industry going during the war.

Competitively, too, Westerners certainly don't have to worry about John L. Lewis as do easterners who must depend almost entirely on steam power, and chiefly upon coal.

But if power costs don't worry local industrialists, the same can't be said about rising transportation costs.

Many makers of heavy, bulky products are finding the economic limits of their marketing area sharply prescribed. More than one manufacturer who used to ship freely to Kansas City and Dallas now finds he's competitively at a disadvantage anywhere beyond Denver.

This sort of thing works both ways however, for it correspondingly restricts Westward flow of competitors' goods into Coastal markets. The economics of transportation is going to get a good deal of earnest attention in the next few months while these factors work themselves out on both sides of the Rockies.

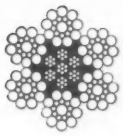
On the Other Hand—

On the obverse side of the coin, many eastern manufacturers, inspired by growing competition in the West, are finding that they're going to have to set up Pacific Coast warehousing facilities in order to provide quicker delivery service to local customers.

Among the latest to formulate plans for centralizing large-scale distribution facilities in the Los Angeles area are Sylvania Electric Products, which reportedly will erect a large warehouse for

(Continued on page 90)

EDWARDS
Wire Rope



Announces the appointment of

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to expand wire rope service to

CALIFORNIA
Industry

The Big Red Reel, symbol of the service built into all Edwards Wire Ropes, is now available at the Republic stores in the localities listed below.

AVENAL - BAKERSFIELD - CUYAMA - FRESNO - GARDENA
HUNTINGTON BEACH - LONG BEACH - LOS ANGELES
NEWHALL - OAKLAND - SAN JOSE - SANTA FE SPRINGS
SANTA MARIA - STOCKTON - TAFT - VENTURA - WILMINGTON

(Continued from page 88)

electronic products on land just purchased in the central manufacturing district. Richard Hudnut will set up both warehousing space and executive offices for the cosmetic firm. E. R. Squibb, whose $500,000 district headquarters just opened may be the forerunner of further expansion to thrice its present size.

The pharmacal company says it feels obligated to maintain adequate stocks here "to cope with almost any conceivable major disaster such as earthquake, fire, flood or even war;" but even if none of these catastrophes should overtake the population of this health paradise, the Squibb officials feel logic dictates enlargement of their facilities in the southern California-Arizona market.

World's Greatest Consumers

As a company spokesman puts it, "This area, on a per capita basis, consumes more of the products of our company than any other in the world."

One local analyst is urging manufacturers here to get themselves a good set of maps of the east, subscribe to some more newspapers and magazines, and keep in better touch with industrial news throughout the country so as not to overlook possibilities for new markets.

Most Westerners, for instance, are familiar with the story of the great postwar expansion of pipelines eastward, bringing natural gas for the first time to many sections of the U.S. But it took Rheem Manufacturing to pinpoint these areas as promising new sales territories and move in with strong promotion of its gas-fired heating equipment.

Another Westerner to step up its eastward expansion is Clary Multiplier, which pioneered its coin sales plan in its home territory of Los Angeles but now will sell its office machines nationally on the "two silver quarters a day" basis.

A Hint

A hint for local manufacturers was picked up in New York by two engineers of the Los Angeles Department of Water and Power, who have been ringing eastern doorbells to drum up subcontracting business for home-town industries.

In New York, George R. Hoffman, vice president of one of the nation's largest buying agencies, opined that Southland manufacturers haven't yet grasped the potential buying power for their products among eastern counterparts of their West Coast customers.

As an example, he said a maker of auto accessories might just as well increase production of some of the accessories or parts he is manufacturing for local assembly plants and market them as replacement parts through auto accessory stores throughout the country.

"Cost of Marketing" Blues

To the chorus of moans stirred up by recent freight rate increases, add the plaint of Southland citrus growers. Cost of marketing this season's crops went up substantially this year, upped notably by a nine cent freight boost, which brought the shipping rate some 30 per cent above the 1946 figure.

"It now costs more to ship a box of oranges than it does to grow one," cried Paul S. Armstrong, general manager of the California Fruit Growers Exchange.

Armstrong went on to say a carload of oranges delivered in the East must bring $2263 to break even. Of this amount, $716 is needed to grow the fruit, $762 to harvest, park, and sell it, and $785 for transportation to the market.

Deep Freeze

Last winter's freeze cost California and Arizona growers about 32 per cent of their crop, a loss of about 46,000 carloads of fruit. Higher market prices did not fully compensate for these losses and for higher costs of cultivating, handling, and orchard heating.

More encouraging is word that the Sunkist organization has decided to embark on large-scale production of frozen orange juice, enabling member growers to hedge against competition in the national market from Florida's fast-growing output of the new frozen product, a situation described recently in these columns.

Still the Problems Come

The citrus industry faces new problems under pressure to make it comply with the air pollution law, for the smudge pots which are lighted on cold nights when the mercury drops below freezing are said to contribute substantially to the now famous smog of this area.

For more than a decade, threats have been made to compel substitution of smokeless burners for the open pots with their billowing clouds of odoriferous smoke. Experts long ago established that it's the warm air, not the smoke, that saves the fruit, but efforts to push modern equipment have met with passive resistance.

Now the citrus men are in the same boat with industrialists with their smokestacks and householders with their backyard incinerators in feeling the bite of the new law.

A new angle is to be tried this winter—"canned sunshine," stored in containers spotted throughout the orchards and controlled thermostatically.

The "canning" is to be done by filling the cans with chemicals which are supposed to absorb heat from the sun, changing in the process from solid to liquid forms. The process would be reversed when the temperature in the grove dropped to the danger point and the melted substance would return to the solid state, releasing the solar heat.

According to Larry Crosby, brother of the well-known singer and director of the Crosby Research Foundation, the process is based on research of a Massachussetts Tech scientist. He says the average winter sun in southern California gives 50 square feet of surface the same heat one gallon of fuel would if burned without waste.

And Now Caterpillars

While citrus growers were thankful for warm weather in late fall months, farmers of the Coachella Valley were praying for a freeze that would destroy the hordes of salt mark caterpillars swarming across the cotton-growing section north of Salton Sea, ravaging also crops of string beans, squash, eggplant, pepper, spinach, and broccoli.

Worst fear of the growers was that the aftermath would be an even larger hatching next year, in time to start eating cotton before foliage bolls are ripe, inflicting heavy damage on the anticipated 7000-acre crop.

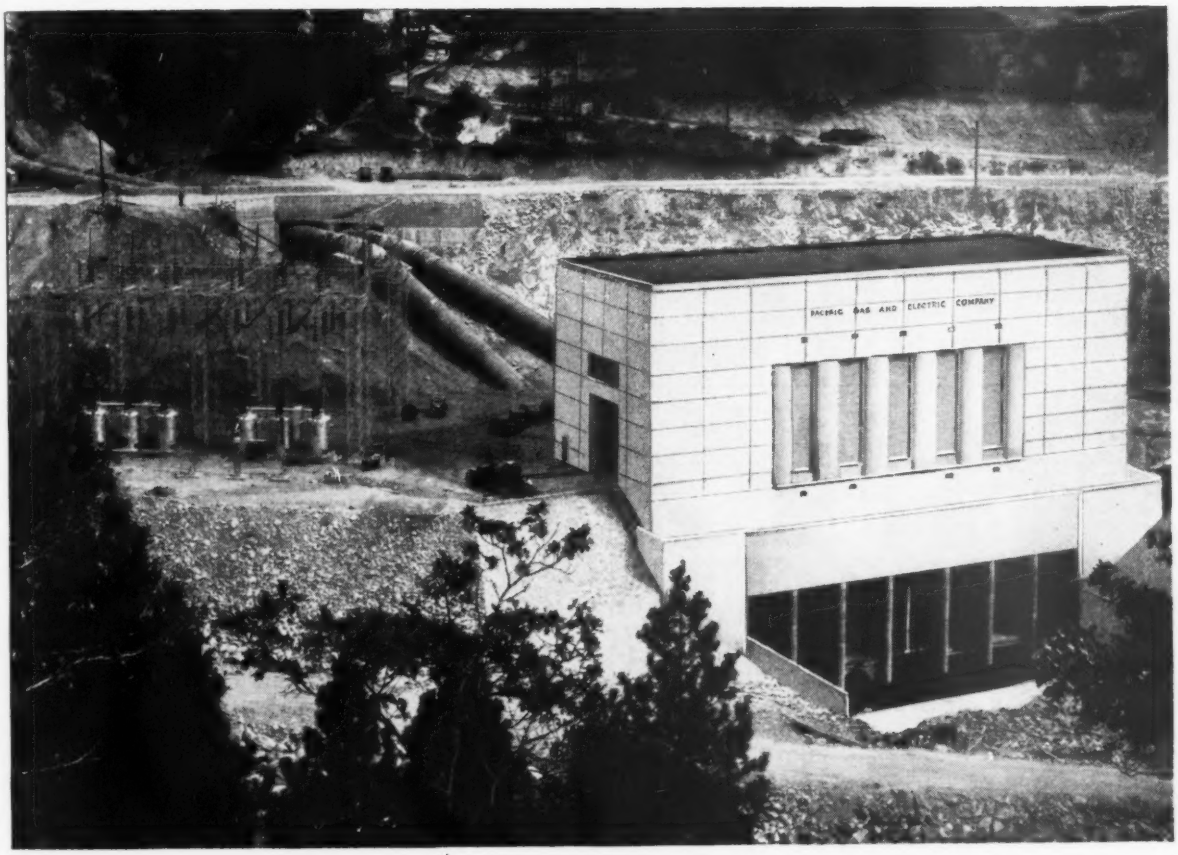
A bright spot in southern California's economy is the welcome word that underground water levels in the Orange Belt are rising slightly. The phenomenon was entirely man-made, caused by release of surplus Colorado River from the aqueduct of the Metropolitan Water District, but it represented success of a crucial experiment.

Orange County Water District had purchased 10,000 ace-feet of the precious fluid for $150,000 and had it released into the Santa Ana River bed, in the hope of replenishing the water table in wells of the area. Most Orange County wells are drawing from below sea level, with danger of encroachment of coastal salt water.

Could Be Done

The test showed it would be possible — at considerable expense — to save these wells and prevent what could have almost catastrophic effect in this rich ranching area. Rapid population growth has brought widespread lowering of well levels, although some of the larger cities have switched to Colorado River aqueduct water to relieve the increased domestic load.

ANOTHER NEW POWER PRODUCER TO MEET GROWING INDUSTRIAL NEEDS



A NEW HYDROELECTRIC GENERATING GIANT . . . fresh from P. G. and E.'s power - construction assembly line . . . is Cresta Powerhouse 30 miles east of Oroville on the Feather River. The new plant has an installed capacity of 101,000 horsepower. It is one of two great new plants in a $62,000,000 hydroelectric project on the Feather River. The other plant, Rock Creek Powerhouse, is scheduled to put another 169,000 horsepower into service next March.

A RECORD IN POWER BUILDING. Cresta is the sixth new power plant completed by fast-working construction forces since May, 1948. Its two mighty generators bring the total of new-built generating capacity since VJ-Day to 694,200 horsepower — a capacity 38% greater than that of Shasta Dam. Work continues on other new plants which will add another 1,107,000 horsepower.

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REGIONAL REVIEWS
Sierras to the Sea

Cheaper Industrial Water for Richmond

SAN FRANCISCO—The Richmond area has decided to be handicapped no longer by lack of reasonably-priced industrial water, and as a result the Southwest Contra Costa County Water District has been organized, in the expectation of being able to draw an industrial water supply from the Contra Costa Canal.

At present the area is supplied by the East Bay Municipal Utility District, which is so intent on paying off its indebtedness that it will grant no special rate for industrial water. Having stood a price of 16c a thousand gallons as long as possible, while the Martinez - Pittsburg - Antioch district was getting an industrial supply from the Contra Costa Canal at 3c and getting the breaks on attracting new industries, the Richmond people decided it was time for a change.

Extend Contra Costa Canal

Taking the matter up with the U. S. Reclamation Bureau and Senator Downey, they found it would be possible to have the Contra Costa Canal, which is part of the Central Valley Water Project, extended to serve Richmond and a part of the adjoining town of San Pablo. The new water district will have to provide its own storage reservoir and distributing system, but this will be paid for by the various industrial users. As the water will not be used for domestic purposes, it will not require treatment except as some individual users may need to do so for their own purposes.

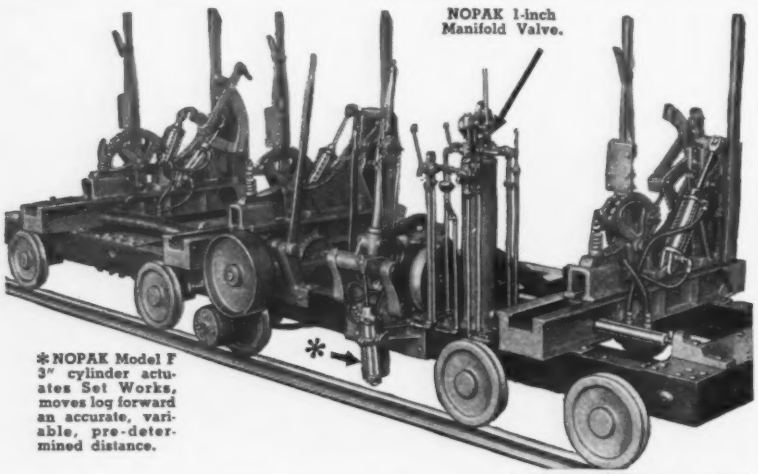
It will take several years for the system to be set up and built, and meanwhile "East Bay Mud," as the East Bay Municipal Utility District which provides Oakland, Berkeley, Richmond and other east bay municipalities with water is popularly called, may decide to give a better industrial rate. The District is said to be putting aside 50c out of every dollar of revenue in order to pay off its bonded indebtedness, but industrial water users believe the District could give an industrial rate of 8c without loss, because it has an ample supply.

Reber Plan Aired

Meanwhile a water system of vastly greater proportions, namely, the much-discussed Reber Plan, has been given an airing before a Congressional committee, which held many sessions in San Francisco in December to hear advocates and opponents. It was a triumph for John Reber, who has been working on his plan for 42 years, and finally acquired enough support for his proposed face-lifting of San Francisco Bay to justify attention from Congress. The testimony was largely a repetition of previously known facts and opinions, and of course the committee hearing does not advance the scheme very far.

His proposal, which has been previously outlined in WESTERN INDUSTRY, would put a solid mole across the upper bay, from Point San Quentin to Castro Point in Contra Costa County, built of two rock walls filled with mud dredged from the bay.

Between San Francisco and the East Bay (south of the present Bay Bridge) two more rock walls —2,000 feet apart —would be built. The space between these walls would be filled by dredging, creating a causeway across the bay.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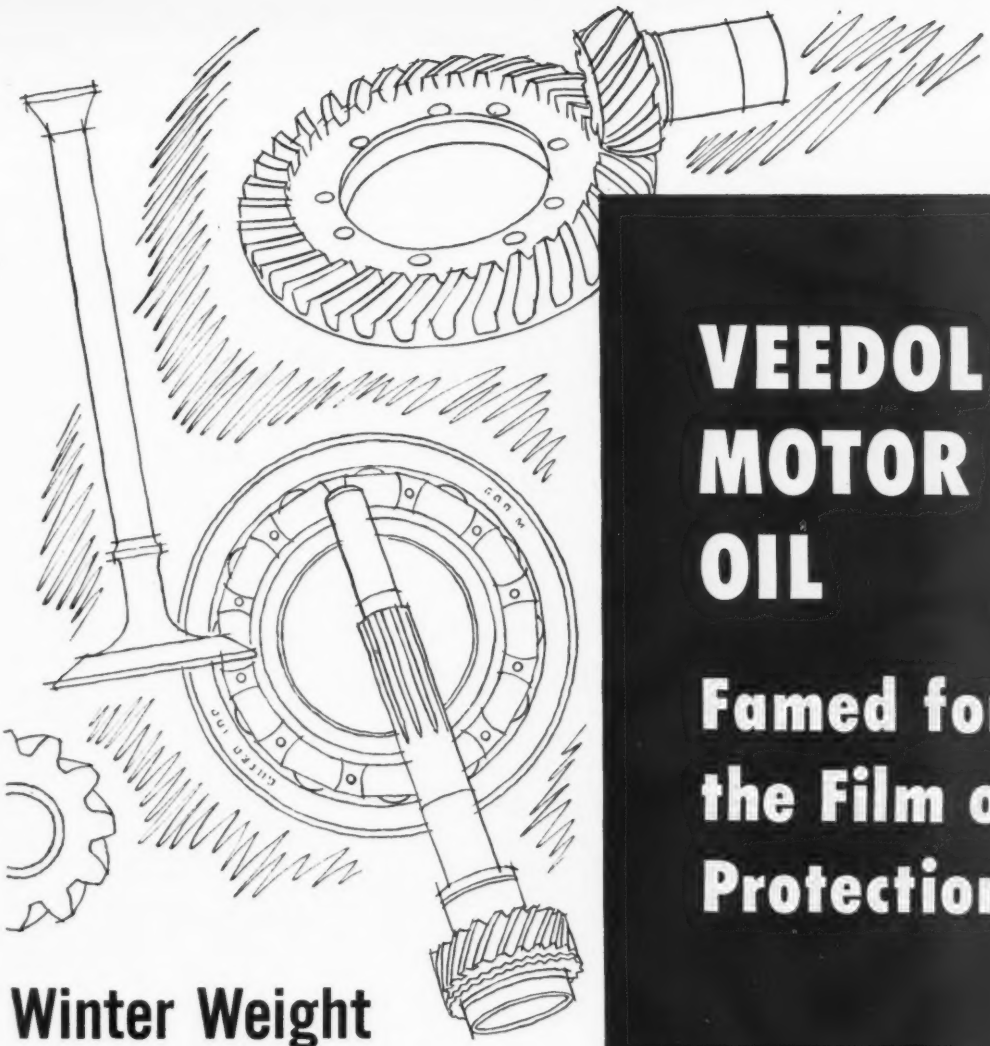

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Programs Instituted To Offset Dwindling Salmon Runs

Washington's governor seeks to rehabilitate fisheries by attacking water pollution; dams and illegal fishing also troublesome

SEATTLE—That great silver horde of the sea which contributes so greatly to Pacific Northwest industry and recreation came in for some pretty close scrutiny in recent weeks. We refer to the salmon, prime food fish and prime catch of those who fish with the sportsman's lure.

Pollution, construction of dams, and illegal fishing by commercial operators particularly are the main thing to which the salmon conservationists have pointed with greatest vehemence as they have decried the dwindling—as they see it—salmon runs.

Three Routes

There are, in the Portland-Seattle-Vancouver, B. C., area, three principal salmon routes to the spawning grounds in the hundreds of shallow creeks of the Pacific Northwest. These three are: the Columbia River, which, in its lower reaches, forms the Oregon-Washington boundary; the many streams emptying into Puget Sound within the State of Washington; the Fraser River, which, although it is entirely a Canadian stream, empties into salt water just above the international boundary.

Fish in the Fraser pass through the waters of both the United States and Canada enroute to the river and the who and the how of Fraser-bound salmon fishing has long been somewhat a bone of international contention.

Washington's Governor Arthur B. Langlie in November announced that one of the chief aims of his administration would be the rehabilitation and development of the Puget Sound fisheries. Implementing the announcement, the Governor indicated the way conservation and protective measures would take by saying that immediate attention would be given to problems of pollution. Chief target of the pollution complaint is the pulp mills, although an occasional nod is given to domestic sewage and the wastes of other industries.

So They Kill Two Birds

Fortunately, the pulp mills now have available a process refinement which will drastically reduce waste liquor discharge and at the same time recapture a high percentage of chemicals used and also produce important fuel values.

However, installation of the waste liquor recovery plants is quite expensive and the larger mills will have a considerable advantage on a per ton basis.

Unfortunately, the pressure exerted against the pulp mills on the pollution question is felt in many circles to have more political inspiration than true concern for preservation of the salmon run.

Construction and projection of more and more power and irrigation dams on major salmon streams is another trend which causes the conservationists concern. Major worry at present is on the Columbia River, which has many superlative dam sites. But there is no real freedom from fear with respect to some Puget Sound tributary streams and the Canadian Fraser with its good power potential.

Lo, the Salmon

Certain it is that construction of the dams, with no regard for the fish run, is disastrously ruinous to salmon. But even with the installation of fish ladders, hatcheries, and other man-made devices the fish biologists still do not have the complete and final answer on what may ultimately happen to the salmon.

Third threat to salmon is the overzealous commercial fisherman who disregards the laws of conservation and decency by fishing with over-size, illegal gear, who poaches in closed waters, and who otherwise fails to play the game and so hastens the day when his own throat is cut along with the whole salmon industry. One can look for crackdowns in this sphere. Yet, there is no denying that more and more commercial fishing gear is out after what fish are left.

All these pros and cons on salmon were aired in a special Congressional subcommittee hearing which took place in Seattle in November. Apparently the main effect of that hearing was to serve as a sounding board to bring problems of the declining silver horde out into the open.

Power Outlook Improves

The power outlook has improved recently. Vividly recalling the power shortage embarrassments of last year, power people in all categories met earlier this year in anticipation of a repeat performance, but now it appears that the 1949-50 winter will pass by with no power abnormalities. Stored water is ample at the present time.

Another factor of importance is that there is an abundance of fuel oil on hand—as against a shortage last year—and the price is also sharply down from a year ago.

Meanwhile oil excitement in Western Canada continues. That is important to industry south of the Canadian border because Washington and Oregon offer larger industrial and domestic markets for natural gas and oil than does Canada's thinly scattered Western population.

Important developments in Alberta province have been reported on previously, but now the belief is mounting that oil will be found farther and farther West in Canada, extending even to the large islands, such as Graham and Queen Charlotte, off the rugged British Columbia coast. Seepages in the area were noted long ago, but now ex-

ploratory drilling is going on. Many Canadian and American companies are staking out large acreages in their prospecting.

CVA Battle

Battle over the creation of a proposed Columbia Valley Authority continues, with new foes continuing to pop up. The forest industries are becoming quite vocal on the anti-CVA side. One of the latest groups to say "no" is the Pacific Logging Congress, a powerful all-West aggregation. At the 40th session, held in Seattle in mid-November, one resolution sounded a vigorous "no" on the CVA.

Pacific Northwest Trade Association, meeting in Spokane about the same time, also chose to say "no" on CVA. This body, which is something of a regional chamber of commerce, with some 40 chambers from Alaska, Western Canada, Washington, Oregon, Idaho, and Montana supporting it, also went on record on other subjects, some of which were:

P.N.T.A. on Record

Recommended priority for development of water power sites on British Columbia streams which were not important for salmon propagation.

Opposed to further federal acquisition of land in the West.

Favored more ships for the Puget Sound-Alaska run.

Opposed the application of the Denver & Rio Grande Railroad for joint through rates on transcontinental traffic to and from the Pacific Northwest.

Recommended that purchases, handling and shipping of Economic Cooperative Administration supplies for Korea pass through private trade channels.

Recommended repeal of the 15 per cent transportation excise taxes.

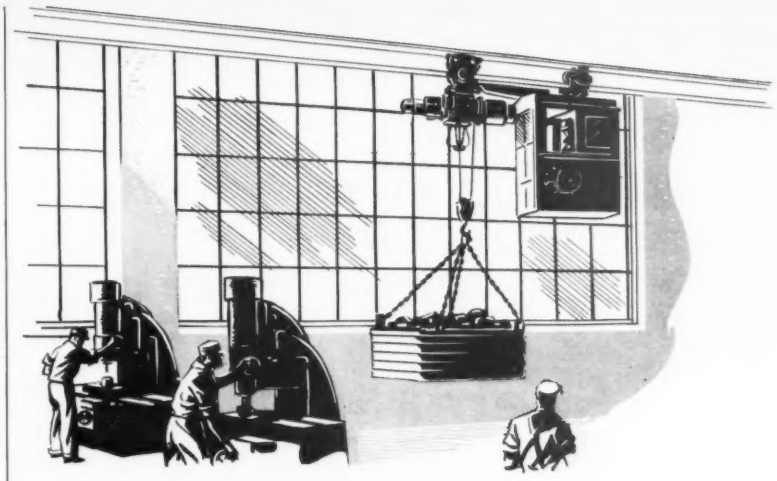
Urged adequate defense for the West Coast and opposed the policy of disrupting Western industrial plants and moving them inland, supposedly for defense reasons.

Supported the Hoover program for streamlining the federal government.

Endorsed the full development of Alaska's potential in forest and other industries and recreational attractions; urged improvements of its transportation facilities.

$1,500,000 For Development

From Washington, D. C., has come word, through C. Girard Davidson, assistant Secretary of the Interior, that the department is seeking approval of a six-year $1,500,000 development program for the Pacific Northwest.



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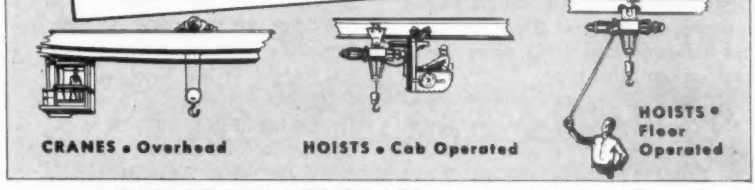

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Employment Stabilization Point Seems to Have Arrived

Influx keeps unemployment loads high, but conditions better than last year, due largely to upturn in forest products industries

PORTLAND, ORE. — Employers in the lower Columbia empire have climbed out on a crystal-ball limb as far as February, 1950, and made a prophesy that things employmentwise have really leveled off—employment didn't reach 1948 peaks during the summer and it won't reach 1948-49 winter lows.

Oregon unemployment compensation commission agrees with the forecast based on its own survey of more than a thousand representative employers.

Manufacturing and Construction

Some manufacturing and construction groups have as many or more employees on the job this winter compared with a year ago—but unemployment claims among their employees have been been running two or three times as high as a year ago. This contradictive statement is partly explained by the weeding out process as efficiency of production lines is improved, plus the steady influx of new workers continuing to arrive in the Pacific Northwest.

Big Stabilization Factor

A big factor in the stabilization is continuing healthiness of lumber, plywood and allied industries. That expected winter slump in the lumber market didn't appear during November, bringing the area's biggest industry comfortably close to the annual pickup in spring rail business after the Christmas holidays—and a big order file to work on until that time.

Market price of most lumber and plywood company securities has reflected that healthy market condition. It has been reflected in supply industries that serve lumbering and logging and in community business.

Here's how the Oregon unemployment compensation commission forecast reads for basic groups through February:

Employment Forecast

Construction — Open fall helped keep building activity high. Employment down only 10 per cent by mid-November from August highs. Many projects to be started in next few months unless weather prohibits.

Food products—Seasonal slowdowns to bring more layoffs for next few months, but the low should be considerably above last winter.

Lumbering and Logging — Drop from August to February to be much smaller this year.

Textiles and apparel—Employment increases that started in October to continue on small scale through February.

Other manufacturing — Slight letdowns in a few heavy industries, but over-all letdown to be only 2 or 3 per cent.

Transportation and Utilities—Slight but steady employment rises during next few months.

Wholesale and retail trade—Christmas retail hiring to be offset by layoffs among wholesalers and jobbers handling Oregon products for shipment elsewhere. Retail employment will drop 8 per cent from December to February.

Finance and service—An upturn of 1 to 2 per cent may come after the holidays.

Steel Strike Settlements

Steel strike settlements have set a pattern for labor-management negotiations to be conducted in the Columbia empire for 1950. IWA-CIO lumber and logging workers, who will map their 1950 negotiations at a Portland meeting in January, have indicated that a health and welfare plan may be the only major issue in lumber negotiations for 1950.

Like in steel, it will add to the cost of the product if successfuly negotiated by labor.

Seriousness of the power situation in Oregon and Washington has been underlined again by the Bonneville administration's Dr. Paul J. Raver.

There probably will be no firm power from the big federal generators for private utilities of the two states when their one-year contracts come up for renewal in September, 1950, he says.

A Federal Policy

It's because of the federal policy of giving public agencies first chance at available firm power. It resulted in drastic cuts for the private power companies in contracts signed this fall. The situation, Dr. Raver says, will continue at least until McNary Dam is in production in 1953-54.

It is pointed out, however, by private utility sources that the "cold war" between Bonneville and the private utilities isn't ended and this is just another chapter.

"Dump" Power Is Available

Actually, there normally is considerable "dump" power available at the federal dams for the private utilities—and the latter also have their own hydro and steam plants to supplement the federal supply. On top of that is a 12,000-mile network of the Northwest power pool, which distributes needed power where it is most needed and insures against blackouts in any unfortunate areas.

The situation also writes the preface for the region's heavy-power-using industrial expansion for the next four

years despite that installed power capacity already is double the U. S. average in ratio to population.

But planning and action is continuing. Latest major moves are by the Port of Portland and the Portland commission of public docks. The port has negotiated cancellation of the government's Swan Island lease ahead of time and industries already on the island now can prepare long-term leases and plan expansion with a stable housing situation.

The dock commission has traded its out-of-the-way Oregon Shipbuilding Corporation property with the War Assets Administration for near-in Willamette Iron & Steel Corporation properties extending for a mile along the west side Willamette River waterfront.

Waterfront Face-Lifting

The 37-acre Wisco property will be developed into a modern transit terminal, but not immediately. In the meanwhile the facilities will be leased.

Besides giving the city a new transit terminal within the city proper, it also clears some of the litigation clouds over the vast 84-acre Oregonship property.

The dock commission has been litigating for restoration of the property by the government, which face-lifted it for one of Henry Kaiser's record-breaking shipbuilding ventures during the war.

Litigation and ownership troubles have frightened away at least two major industries "fishing" for sites.

Marking a new phase in the vast Columbia basin irrigation project to be fed by Grand Coulee, the Bureau of Reclamation was to open bids in mid-December for 58 miles of laterals to irrigate 180 farms northeast of Moses Lake.

It is the first block of the 87,000 acres the bureau expects to have irrigation water on by 1952.

Second Industrial Engineering Institute

January 27 and 28 are the dates of the second Industrial Engineering Institute, to be held at the Berkeley campus of University of California.

On the program will be Professor Ralph M. Barnes, UCLA, Harold Engstrom, of Sylvania Electric Products, Inc., Flushing, Long Island, and Drs. C. C. Keachie and Mason Haire, of U.C.

Those attending will receive a printed copy of the proceedings.

This session of the Institute will have as its subject: "Work Simplification and Suggestion Systems."

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Gas Lines Are Common Carriers And Thereby Hangs Trouble

Way apparently open for natural gas producers to find routes into markets without building transmission systems themselves

DENVER—Industrial users of natural gas all over the Western half of the United States are rubbing their eyes in unbelieving wonder. Maybe it is too good to be true. Still—some plants already are benefitting by the new conception of common carriers.

What has happened is that the transporters of natural gas finally have knuckled under, in a few instances at least, and are beginning to act something like other transporters.

Years ago when coal companies tried to ship their coal on trains, the railroad companies said, in effect, "Nuts to you, we produce coal ourselves. Build your own railroad if you want to sell your coal."

The Worm Turned

After some bitter battles in the courts, the idea of a common carrier was established and the coal companies had no further difficulty in getting the railroads to haul their coal. But a similar battle has been going on in the courts of the land during the past decade, with regard to interstate transportation of naural gas, and now the same thing is coming up in regard to transmission of electric power. *An Idaho Power Company electric transmission line between Boise and American Falls, crossing part of the public domain, must "haul" public power to Uncle Sam's customers as well as its own power to its own customers. Next thing, any independent who buys or generates electricity may be able to use such a common carrier line for transporting power to certain classes of customers along the "right-of-way."

A cement plant in southern California or an orphans home in South Dakota might have used natural gas for fuel, buying it from the gas company at whatever rates the one supplier offered. If the gas rates seemed too high, the alternative was to buy some different fuel—coal, electric power, oil or whatnot.

Buyer's Market for Gas?

Today—or in most localities, tomorrow—there is competition among the sellers of natural gas and a buyer's market prevails. Another gas company can come along and make a bid for the business of the cement plant or orphans home, undercutting the price offered by the original gas company. As a result, cheaper fuel costs are being obtained by industrial users and certain other classes of users.

Back in the gas fields, the new conception of common carrier pipelines is having its effects, too. Drilling is being stimulated by the higher prices being offered. Competition has come to the gas fields, too. Instead of only one buyer —the pipeline company—the producers of gas now find themselves able to bargain with various purchasers and to hold out for higher prices.

Competition Stimulates Drilling

Already the price of gas in the field is going up and the higher prices are bringing about more drilling. In eastern Montana's gas fields one new field has been opened up at Pleona since the new turn of events took effect, and several operators have announced fairly ambitious programs.

The only pipelines that are real common carriers are those that cross some portion of the Federally-owned public domain in interstate commerce. Pipelines are peculiar things, legally, and each one has its own certificate of convenience and necessity with its own charter, so to speak, defining its allowable operations.

The Federal Power Commission is acting somewhat cautiously, afraid to exercise the full measure of power now accorded it by the courts, because the issue is full of political dynamite and the carriers that face the loss of their monopoly privileges are politically powerful.

South Dakota Brick Yard

First customer served under the new dispensation for gas companies is the Black Hills Brick & Tile Company of Belle Fourche, South Dakota. It gets its gas from Mondakota Gas Company via a common carrier pipeline owned by the Montana-Dakota Utilities Company. The gas originates in Montana's Baker-Glendive field.

Open For Business

Contracts with other industrial, institutional, municipal, and commercial users of gas are being negotiated by Mondakota now that its long legal battle for the right to ship gas through the Montana-Dakota pipeline has been setled.

Incidentally, Montana-Dakota Utilities has won authorization to lease and operate a new 340-mile natural gas pipelines already serving eastern Montana, the western part of the Dakotas and possibly northwestern Nebraska. It has not been learned whether the authorization for this nine-million-dollar pipeline is such as to provide for some public use of the line or if it will be used only by one company.

Competition or Monopoly?

Meanwhile, industrialists are watching eagerly to learn if there really will be competition—and a buyer's market —in natural gas at the point of its ultimate use. The effect in Southern California could be enormous, as vast and rapidly expanding gas reserves in the San Juan Basin of Colorado, Utah, and

*Reference:
Western Constr. News
Nov. 15, '49—P. 67

New Mexico are tapped by pipelines from the Pacific Coast. If the new competitive practice prevails, it will touch off the greatest gas drilling boom the nation has ever seen all over the public domain states. This already is shaping into sizable proportions, but so far the big interest has been in oil, with gas only an incidental.

Construction Expanding

After what seemed like a slow start, the construction industry now dominates the scene in most parts of the Rocky Mountain area. There seems to be no let-up in sight and architects report more and more important projects are about ready to leave the drawing board stage and turn into contracts.

Industrial and heavy construction continues away out in front, chiefly because of the vast extent of public power projects now under way in the area. However there is an impressive amount of residential and commercial construction going on in large and small communities all the way from El Paso to the Canadian line, and beyond that invisible line the pattern of activity continues in boom proportions all the way past Edmonton, Alberta. Nobody can remember when there was so much building being done.

Very Sad Miners

Coal miners have been cocky for years and have lorded it over the hardrock miners whose industry has been in a mess since the war production rush subsided. Now the coal miners are blue, with two-fifths of their income slashed off when John L. Lewis proclaimed a three-day week. Virtually all mines had been working a five-day week. The impoverished miners, hoping to recoup their strike losses before Christmas, were plunged into despair again. The situation in the miners union is ripe for a revolution, which might be a good thing for everybody, particularly the miners.

This situation is not particularly a Rocky Mountain problem, but the coal mining industry is important in most of the mountain states where the nation's greatest coal reserves eventually will make the area a great industrial empire. That may be about 50 years hence.

Food Manufacturing

Charles E. Brokaw, regional director of the Bureau of Foreign and Domestic Commerce at Denver, points out that food manufacture constituted the biggest part of Colorado's 1947 manufacuring total. That is the latest year for which accurate figures are available, and some interesting tabulations have just been released.

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E-1508

Weldless Steel Sleeves

A new roller for turning out weldless steel sleeves and rings is now in operation at *C.B.S. Steel & Forge, Los Angeles*. This ring roller, first in the West and one of only five in the country, is adaptable for rolling sleeves and rings from 50 to 1,500 pounds of varying lengths and diameters. Different contours and shapes, inside and outside, can also be made on it.

E-1509

*Adhesive A-1 Sticks Fast

Adhesive A-1, produced by *Armstrong Products Co., Warsaw, Indiana,* is a new thermosetting resin composition that will bond to each other such materials as metals, glass, ceramics, rigid plastics, wood, rubber, with a glue line often stronger than the materials bonded. This adhesive contains no volatile solvent, does not shrink or swell upon hardening, requires no primer coating or open assembly drying, requires only contact pressure, and cures at heats from room temperature up to 200°F.

E-15010

*20,000,000 Megohmeter

An instrument designed for the precise measurement of electrical resistance over a range from 300,000 ohms to 20,000,000 megohms is now distributed for the English manufacturers by *Herman H. Sticht Co., Inc., New York City*. Power supply is line voltage from 110 to 115 and 190 to 260 volts AC. The overall range is divided into 6 decades, which are switch controlled. Bulletin 1029 gives further information.

E-15011

*Simple Talker

Dial-A-Talk intercommunication systems, put out by a firm of the same name in Portland, Oregon, eliminate the usual bulky connecting cables and remove the need for an AC outlet near each station. Stations can be moved or added at very small installation cost. This system uses only a ¼" flexible cable conduit containing four wires, running to each station. One central control panel has all the tubes. Sets are small as a telephone, have a telephone dial, allowing unlimited combinations of numbers.

E-15012

*Wire-Soldering Boon

At last, electricians and radio and appliance men can get a wire with plastic insulation that doesn't peel or strip or shrink when soldered. *William Brand & Co., New York,* are turning out a plastic insulated wire without overbraiding or jacketing of any kind—a tinned-copper conductor with insulation of especially compounded stabilized vinyl dielectric one-thirty-second of an inch thick. It is approved by UL for 105°C continuous operation. It is free-stripping and permits practical applications where soldering operations are encountered.

E-15013

Pneumatic Timing Relay

The Bulletin 849 pneumatic timing relay is a new adjustable timer announced by *Allen-Bradley Co., Milwaukee, Wis.* It is available for AC or DC, and utilizes a synthetic rubber bellows for controlling the tripping time. The range is easily adjustable from 10 cycles to three minuttes, with an accuracy of plus or minus 10 per cent. The relay resets instantaneously and performance is unaffected by temperature, humidity, or vibration.

E-15014

*World's Strongest Scotch Tape

"Scotch" brand filament tape No. 890, made by *Minnesota Mining and Mfg. Co.,* with 500 lbs. tensile strength per inch of width, will soon be on the market. Sample rolls are immediately available. This tape has an acetate film backing, and glass filaments instead of rayon. These filaments are permanently imbedded in a resilient shock-proof rubber adhesive, pressure-sensitive. Tear resistance is far greater than can be measured on the ASTM-approved Elmendorf tear tester. It is a natural for jobs like banding hundreds of pounds of steel pipes, for banding raw lumber, wall board, window frames, etc., and for binding materials to pallets. It will stretch only about 6 per cent. It comes in 72-yard lengths, and in standard widths of ½, ¾, and 1 inch, with other widths made on order. First production will be of transparent tape.

E-15015

*AC Electrolytic Capacitors For Continuous Duty

This new application of electrolytic condensers should be cheaper and more compact than paper capacitors formerly used. Known as Sprague Type 11A, these capacitors are ideally suited for across-the-line power factor improvement at low voltages. They may be used in applications where starting voltage surges across capacitors may exceed rated voltages by as much as 50 per cent for a maximum of two seconds. They are made by *Sprague Electric Co., North Adams, Mass.,* for 115-volt continuous duty AC service. Another important use is in applications where a voltage drop is required without power dissipation. Sprague Engineering Bulletin 301, available on company letterhead request, gives complete standard ratings of this new line.

E-15016

*60,000 Units Per Minute Counted Electronically

Potter Instrument Co., Flushing, N. Y., announce a high-speed predetermined electronic counter with direct dial setting that will tally units up to 60,000 per minute, with absolute accuracy and reset instantaneously without missing a count. Dial switches on the front panel select the predetermined count. No moving parts are involved. Each tube in the counting circuit has a neon glow lamp associated, making trouble easy to locate. This instrument is also useful for precise frequency measurements, predetermining time intervals, generating square weaves, and frequency dividing.

E-15017

Skids For the Trade

"Dreadnought" skids, produced by *George M. Prescott Co., Los Angeles,* are now being made in any size for any type and height of lift truck. Many industrial requirements call for specially-designed skids, and this firm is ready to furnish them. Skids with heavy-duty reinforcements and superstructures such as stake uprights and tier boxes, and semi-live skids for use with a hauling jack are available.

***Items evaluated by Western Industry's technical advisors on basis of information supplied by producer.**

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Also further information on the following products advertised in this issue:

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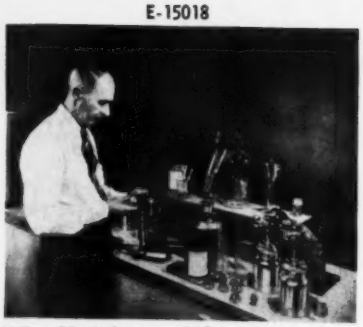
E-15018



Why Not Spray It?

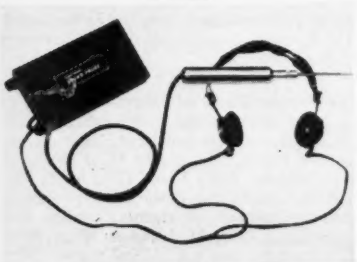
Now, for the first time, a manufacturer can determine without cost whether or not his products can be spray finished automatically. *Binks Manufacturing Co., Chicago,* is offering this service. Manufacturers are invited to send in samples of their products—from tea tiles to table tops, from golf balls to automobile wheels—and have a trial finishing. If the product can be finished automatically, Binks Co. will give the manufacturer, without obligation, a report showing the production and cost which can be expected, based upon actual measurement.

E-15019

*Stainless Steel Barrels In Carboy Size

A new stainless steel barrel of 15-gallon capacity is introduced by *Udylite Corp., Detroit.* This is slightly larger than a carboy (12 gals.) but it has several advantages: elimination of breakage, savings in freight, storage space, and lower freight cost in returning the empties. Pumps fit in easily at the ends of the barrels. These units can be stacked to store.

E-15020



Wired For Sound

A completely redesigned sound probe utilizing the principles of electronics is announced by the *Como-Tex Co., Chicago, Ill.* With this device, sound may be accurately traced to its source; being amplified, without distortion, the sound immediately reveals its character, whether normal or foreign. It is so sensitive that the tick of the finest watch is clear and distinct.

E-15021

*Self-Locking Set Screw

Zip-Grip is described as being the first set screw to have triple-locking action by a combination of interference fit, tension, and the locking of the set screw against the shaft or other part. Lower part of the screw, which enters the hole first, has a standard thread; upper part of the screw, designated as the "activating area," has a larger pitch diameter which creates an interference fit or expansion effect against the thread flanks. This results in a tension or opposed force action, and is the locking effect. Tapping production costs are reduced by requiring no closer fit than Class Two, and assembly speed can be increased because these screws (1) are easily inserted, (2) require no outside locking devices. *Set Screw Mfg. Co., Bartlett, Ill.,* makes them.

E-15022

*This Sound Recorder Has the Last Word

When it comes to sound recorders, "Recordall," manufactured by *Miles Reproducer Co., New York City,* has more features than we've seen to date inside one box. It is light (15 lbs.) and compact (7″ high, 8″ deep, 13½″ long). A permanent jewel records or plays back continuously up to 3½ hours (24 hours on custom models) on each face of an endless safety film belt, that can be replaced in two seconds. Recording cost is 2½c per hr.; current consumption is 50 watts. Any point of a 3½-hr. recording can be located in six seconds. Prices run from $300 to $890 for this quality instrument.

E-15023

Bladeless Trash Pump

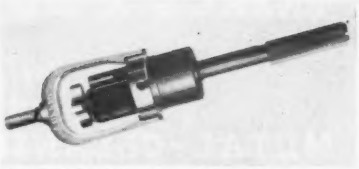
A new type bladeless pumping unit for handling trash and sewage is announced by *Fairbanks, Morse & Co., Chicago.* Fluid passes through the impeller via a single rotating channel, with centrifugal force doing the work. Anything that will enter the eye of the pump will go through it. Sizes range from 2″ to 5″. Price is competitive.

E-15024

*Fluorescent Sun Lamp

A new Westinghouse fluorescent sun lamp designed to irradiate any interior at low cost with the beneficial rays of natural sunshine is available in either 20 or 40 watt size. It is identical in dimensions and electrical operating characteristics with standard fluorescent lamps. It has an output concentrated in the mid-ultraviolet wave lengths (2800-3200 Angstroms) and a life of more than 4,000 hours, and can be operated for as little as 1½ mills per hour.

E-15025



Portable Honing Head

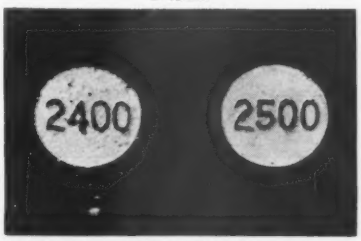
Here is a portable honing tool for sizing and finishing holes that are round, straight, and true to a tenth (if need be) and with surface finish as fine as two micro-inches R.M.S. in hardened steel. These "Honalls," made by *Sunnen Products Co., St. Louis, Mo.,* can be used with portable drill, lathe, or drill press. Sizes range from 3/16″ to 1″.

E-15026

*Non-Skid Steel Floor Plate

With *Alan Wood Steel Co.'s* "A.W. Algrip," industry is offered for the first time a metal floor surface that is really what it says it is—non-skid. This new plate, made by combining abrasive grain and rolled steel, provides a non-slip surface even on a steep incline. And as the surface is worn down, new abrasive particles are uncovered, so the traction value is present as long as the steel remains. It is available in thicknesses from ⅛″ to ⅜″, and in widths up to 60″ max. by 144″ long.

E-15027



Which Tempil° Pellet Has The Proper Temperature?

Tempil° Corporation, New York, announces the development of additional high temperature ratings of Tempil° Pellets to indicate 2100°, 2200°, 2300°, 2400° and 2500°F. Beginning with 113°F, Tempil° Pellets are now available in 12½-degree steps to 400°F, in 50-degree steps from 400° to 2000°F, and in 100-degree steps from 2000° to 2500°F. Tempilstiks°, the crayon form of temperature indicator, are available in corresponding intervals from 113° to 2000°F; while Tempilaq°, the paint form of temperature indicator, is available in similar steps from 113°F to 1600°F only.

***Items evaluated by Western Industry's technical advisors on basis of information supplied by producer.**

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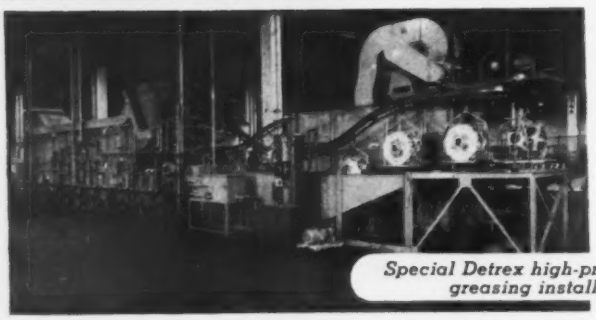

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Helpful Literature

For the Plant Operator Who Wants to Keep Informed

1501-L

Splash-Proof Motors—A new splash-proof motor, designed for locations which are subject to direct streams of water or other liquids, has recently been designed by *Sterling Electric Motors, Inc., Los Angeles,* and is described by them in a new 4-page folder.

1502-L

Steel Office Equipment—A 12-page catalog which features various types of office equipment made of steel—chairs, tables, files, cabinets, clothing lockers, shelving, etc.—has just been issued by *Precision Equipment Co., Chicago, Ill.* Catalog illustrates all items offered and lists prices for each.

1503-L

Cylinder Bulletin — A technical bulletin, illustrating how the pneumatic actuating cylinders made by *Ledeen Manufacturing Co., Los Angeles,* provide nearly automatic operation of a building block machine has just been released. Cylinder details and their application are given, and the machine is illustrated.

1504-L

Pre-Finished Metals Data Folder — The new Data Folder put out by *American Nickeloid Company, Peru, Ill.,* describes the properties, tempers and finishes of pre-finished metals available in brass, zinc, aluminum, copper and steel bases. Folder also contains information on Nickeloid Metals' bright and satin finishes in a variety of striped, crimped and corrugated patterns, and includes data on sizes of sheets, coils and flat strips and on protective surfaces.

1505-L

Trends in National Employment—A research report on industrial and occupational trends in national employment is now available. The report compares the year 1910 with the years of 1940 and 1948, and covers such subjects as trends of employment in specific industries, trends in employment of women by industry group, trends in occupational distribution of employment and factors contributing to the difference in employment levels. The report was compiled by the *Industrial Research Department* of the *University of Pennsylvania.*

1506-L

The Proper Care of Floors—The care of all types of floors and floor surfaces is discussed in the new brochure, "The Proper Care of Floors," put out by *West Disinfecting Company, Long Island City, N. Y.* Part I of the booklet covers the triple process of floor preservation — cleaning, sealing and maintaining. Part II discusses all types of floor surfaces, new and old and proper methods of maintenance. A two-page floor preservation chart lists the many types of surfaces, and proper type of cleanser, sealer and maintainer to be used.

1507-L

Humidity Control in the Plant — *Armstrong Machine Works, Three Rivers, Mich.,* have just issued a 12-page illustrated bulletin containing a discussion of dry air problems, tables on desirable relative humidities and complete data on the operation and installation of Armstrong Humidifiers, both electric and air-controlled models. Also listed are air operated and solenoid operated valves manufactured by the company for use in humidifier control.

READING GUIDE FOR WESTERN MANAGEMENT

A service for all management levels . . . current literature surveyed and appraised by the faculty of the School of Management, Golden Gate College

Making Conference Programs Work

By M. F. Stigers, McGraw Hill Book Company, Inc., New York, 1949. $3.50.

"A conference," says the author of this valuable book, "is an intelligently planned informal discussion of a problem, the discussion being participated in by a number of interested and/or experienced persons and supervised by a trained leader, with the purpose of reaching a useful conclusion or result." Properly used, the conference is a valuable modern administrative tool. With increasing emphasis being placed on communications, the concept of multiple management, and on improved human relations through supervision, the conference method has become indispensable to business organizations.

Some conferences serve a useful purpose; others are a waste of time. Which of these classes a conference falls into depends upon the preparation and planning which preceded it and upon the skill of the leader.

In *Making Conference Programs Work* Mr. Stigers presents material which should make it possible for every conference to achieve a positive result. His book serves several purposes: (1) It shows the reader how to conduct a successful conference and how to teach others to be conference leaders. (2) It gives an excellent range of examples of successful conferences in operation.

In the first part of the book the author discusses 10 practical aspects of training conference leaders. Included here is instruction on choosing the subject matter, preparing the discussion plan, and data on matters such as selecting the time, place, and arrangement of conference space. The second part deals with the use of a conference program. It concerns the evaluation of training programs, the place of a conference program in a total training program, and other pertinent matters. The concluding portion presents material on the use of conference programs in industry and illustrates the foregoing instruction with 96 pages of selected conference reports.

Making Conference Programs Work is a worthwhile addition to McGraw-Hill's Industrial Organization and Management Series. The author has done a thorough job. The material he presents, based on his broad experience in conference leadership and conference leader training, is extensive, well organized, and written in a manner which makes it easy to understand and to use.

Mr. Stigers' book deserves a place in the library of all executives. It is of major value to personnel administrators or executives who wish to introduce the conference method to their organization proceedings or who are now using the conference method and wish to increase the benefits derived from it.

Reviewed by:
HAROLD E. ATKINSON
Assistant Dean
School of Management

Monetary Management

By E. A. Goldenweiser, A Research Study of the Committee for Economic Development. McGraw-Hill Book Company, Inc., New York, 1949. $2.75.

Dr. Goldenweiser speaks on the art of central banking with the authority of long experience and mature wisdom. From his vantage point as Director of Research and Statistics for the Board of Governors of the Federal Reserve System he was able to appraise at first hand the powers and limitations of monetary policy as a means of economic stability. He discusses in this terse book the role of money in the economy, and the ability of the monetary authorities to regulate its volume, availability, and cost. He also summarizes briefly the United States' experience with monetary management from the beginning of the Federal Reserve System in 1913 to 1948. He presents his own views as to how we might deal with current problems of money, banking, and the public debt.

The reader will find this book to be a mine of information, straightforwardly written, and without trace of the "professional jargon" which sometimes baffles the non-specialist in economics. It is the ninth of the CED-sponsored studies in long-range problems of production and employment. It will be followed by another and more extended analysis of monetary and credit policies now in preparation by Dr. Goldenweiser.

Reviewed by:
JOHN F. BENTON
Lecturer in Economics and American Economic History

Briefer Guides From The Management Library

Business Letters That Click

Funk & Wagnalls, New York, 1949. $5.00.

Here is a "how-to-do-it" and sample letter book, compiled by the editors of *Printers' Ink*. It shows how to write letters that will be read, and includes 325 successful samples of every type of business letter.

Business Operational Research & Reports

By John G. Glover. American Book Company, New York, 1949. $4.00.

A manual that outlines procedures used in preparing research reports in the fields of science, industry, and business. It shows how management uses research and reports in planning business activities and policies.

The Toastmaster's Handbook

By Herbert V. Prochnow. Prentice-Hall, 1949. $3.95.

In addition to discussing the responsibilities and techniques of the toastmaster, this manual presents a collection of more than 2,000 useful items for the public speaker. It includes introductions and responses, epigrams, unusual stories, anecdotes and quotations. It also shows how to plan and publicize a program, obtain guest speakers, maintain a time schedule, and plan after-dinner festviities.

Employee Salary Plans in Operation

National Industrial Conference Board, New York, Studies in Personal Policy, No. 100, 1949.

In this report, salary administration plans of nine companies are examined from two angles. First, each plan is described in detail from management's point of view. Then, the policies and practices of each company are considered from the employees' viewpoint with more than 3,000 employees contributing ideas on the salary administration programs of their companies.

Transmitting Information Through Management and Union Channels

By Helen Baker and John M. True. Industrial Relations Section, Princeton University, Princeton, N. J. $2.50.

Here are two case studies of effective transmission of information within industries, one conducted with the cooperation of Johnson & Johnson and Local 630, Textile Workers Union of America; the other with Esso Standard Oil Company (Bayway Refinery) and the Independent Petroleum Workers.

Practical Operating Problems in Personnel Administration

American Management Association, New York, Personnel Series No. 129, 1949.

Includes: A panel session on practical operating problems in personnel administration; wage and salary administration; appraising the personnel department; developments in personnel policies and practices; and surveys to build understanding.

Reviewed by:
BERNA M. CARLSON
College Librarian

Welfare Pressures Weigh Heavy On Western Governors

Utah industries, labor, and politicos unite in definite program to find jobs in order to keep unemployment compensation load down

SALT LAKE CITY—Pension pressures are bearing down on both private industry and governmental units to a point that is making birds of very different feather flock together.

A specific example of this trend could be noted at the recent conference of Western governors in Salt Lake City. From the most ardent fair dealers to the most extreme critics of federal largess and control, the chief executives were in a frame of mind to call upon Uncle Sam to ease the problem with a greatly expanded social security program.

Reluctant Conclusion

Some of the governors intimated they had reached the conclusion somewhat reluctantly. But the alternatives appear to be either a uniform all-inclusive pension system or a multiplication of retirement systems covering single units of government, particular industries or individual companies.

The conference didn't adopt a formal resolution asking for the expanded social security system but directed the executive secretary to prepare such a resolution for later circulation among the governors.

About Moving Industries

Another subject which attracted the apprehensive attention of the governors was the possibility of removal of large industries from coastal to inland areas for protection in case of military attack. The chief executives of Alaska, Washington, Oregon, and California were, quite understandably, most agitated about this. But the intermountain governors, while unwilling to take a position on specific installations (such as Boeing plant in Seattle) did go along to the extent of approving a resolution calling upon the Congress and Administration to:

Exercise extreme caution in transplanting any important industry for reasons of military strategy.

Make greater use of Western natural resources in the national interest.

Regard no part of the U.S., including Alaska, as expendable in the event of an attack.

In keeping with a campaign promise to have the state department employment security put more emphasis on finding jobs to reduce the necessity for unemployment compensation, Gov. J. Bracken Lee of Utah has set up a committee to undertake the task. The general committee is made up of top industrialists, labor leaders and representatives of political subdivisions. And the over-all committee is subdivided into smaller committees to which specific responsibilities are assigned.

Keeping the Promise

There is, for example, a survey committee, which is to make a survey of local employment patterns and prepare a state industrial guide; a labor management committee to keep management and workers pushing in the same direction and to promote employment stabilization; a legal committee to help municipalities, counties, school districts, solve legal entanglements; a legislative committee to prepare groundwork and support for legislation which might be needed; and a finance committee to work out means of financing projects and to assist private industry or public bodies to obtain bank or government credit.

While the appointment of the committee coincided with a more than seasonal rise in unemployment, sponsors of the program emphasize that it should not be regarded as a temporary organization to cope with a temporary situation. Rather it is intended as a permanent set-up to coordinate, plan and stimulate in both the public and private industry fields.

It is intended that the committee will make use of findings of various research organizations which are already functioning, such as the University of Utah's bureau of business and economic research which has just completed a detailed analysis of the southeastern part of the state.

Three Hinges

The bureau concluded that the future growth of that area hinges largely on three things; development of processes for converting coal into smokeless fuel; improvement of livestock, and specialization in agricultural products. But to permit any of these developments in a substantial way, the study points out, the area must have a larger water supply. The residents are well aware of that stumbling block, as shown by their intense interest in the comprehensive development of the Colorado River.

Weber Basin Project

At the moment it appears that the key to water projects in this state, and elsewhere in the West, is some liberalizing changes in the reclamation law. The $70,000,000 Weber basin project has been authorized by Congress but was signed by the President with the reservation that it could not be started until certain policy matters had been ironed out.

These policy matters include lengthening of the repayment period (the Weber project provides for 60 years) and allocation of costs to such non-reimbursables as fish and wildlife conservation and recreation. That problem was again emphasized for the state by a preliminary report on the $26,000,000 Dixie project in the extreme southern end of the state.

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Am'n Management Assn. Meets in San Francisco

Top management of large and small industrial and business firms from all sections of the country will meet at the St. Francis Hotel, San Francisco, January 18-20 to discuss current business problems. The occasion is the annual meeting of the American Management Association.

Meetings will be open to all business executives. Problems of production, marketing, labor relations, organization, finance, and insurance will be treated.

Planning committee for the conference includes Norman Chandler, president, Los Angeles Times; Robert L. Minckler, General Petroleum Corporation, Los Angeles; H. E. Ryker, vice president in charge of manufacturing, Lockheed Aircraft Corporation, Burbank, California; William C. Mullendore, president, Southern California Edison Company, Los Angeles; T. S. Peterson, president, Standard Oil Company of California, San Francisco; William S. Street, president, Frederick & Nelson, Seattle; and W. Walter Williams, president Continental, Inc., Seattle.

Other Westerners on the Committee arranging agenda for the conference are Robert D. Gray, director, industrial relations section, California Institute of Technology, Pasadena, California; J. Hugh Jackson, dean, Graduate School of Business, Stanford University; Almon E. Roth, Roth and Bahrs, San Francisco; Fred H. Merrill, vice president and financial secretary, Fireman's Fund Insurance Company, San Francisco; E. C. Sammons, president The United States National Bank of Portland, Portland, Oregon; and F. B. Whitman, president, The Western Pacific Railroad Company, San Francisco.

1,000,000 Man Hours Without Disabling Injury

Richmond, Calif., refinery of Standard Oil Co. of Calif. recently completed more than 1,000,000 man hours of work without a disabling injury, to qualify for the American Petroleum Institute million-hour safety award.

This is the first time an entire refinery of Standard of Calif. has qualified for the award. The record actually totalled 1,006,919 man hours, with an average work force of 3,655 persons.

Average disabling injury rate of oil refineries nationally is slightly more than 8 per million man hours. Standard's Richmond record for 1948 was only 5.7 per million man hours.

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THE WEST ON ITS WAY

ALASKA

AIR CARGO FOR ALASKA will be easy for shippers to send, if Northwest Airlines and Railway Express Agency plans go through. They move to make 70 Alaskan communities easily available to air cargo shipments. Rates are quoted from Seattle to Anchorage, and from there to point of destination. Of the 70 communities, 67 are reached by railroad; Kodiak, Seldovia, and Cordona, are on the coast. Their ports are open all year round.

ARIZONA

PLANING MILL, new and fully equipped to a 50,000 capacity, is installed by U.S. Forest Service at Fort Defiance.

FIRM QUITS STEELWORK—Johnson Bros. Mfg. Co., 1845 E. Madison St., Phoenix, ceases steel fabrication operations to concentrate on sheet metal work and heating and cooling installations.

PHOENIX KO's NUISANCE TAXES—and thereby hopes to make it easier for industry to pick their city. Voters eliminated (1) a manufacturers' inventory tax and (2) revised downward the method of assessing manufacturers' machinery and equipment taxes.

ARIZONA IS INDUSTRY-HAPPY. 316 licensed manufacturers were listed in 1940; in 1949 the total has risen to 1700.

CALIFORNIA

TUNA PACKERS MERGE—Westgate Sea Products and Sun Harbor Packing Co., San Diego, merge into Westgate-Sun Harbor Co. That firm now has the largest tuna fleet tonnage in this area's history. W. Wade Ambrose of Westgate becomes president of the new firm; Jack Crivello of Sun Harbor assumes executive vice presidency. Both men have equal authority. Business starts about Jan. 1 in the Sun Harbor plant. Plans are under way for plant expansion.

40-ACRE OIL PARCEL—Southern Calif. Petroleum Corp. acquires another 40-acre parcel in the Del Valle- Ramona area, from Stuart M. Salisbury and S. L. Gillan. The firm expects to do exploratory operations next year.

ROHR-NEWPORT STEEL SEPARATE — Rohr Aircraft Corp., Chula Vista, and Newport Steel Corp. become one. About $5,000,000 was paid to the parent company. Rohr Aircraft name is retained, with all present officers.

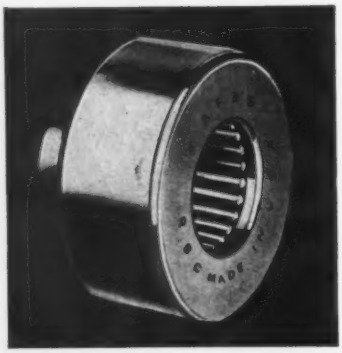
GAMMATRON TUBE PLANT—Robert Dollar Co. opens H-K Gammatron Tube Division, 947 Broadway, Redwood City. They will manufacture gammatron electron tubes for commercial radio transmitting, television transmitting, and other uses.

P G & E GENERATORS GENERATE — Two of them on the Feather River are now in operation, with 101,000 h.p. capacity. A third, Rock Creek, is scheduled to go "on line" in March with 160,000 h.p.

SYLVANIA SEEKS SITE—for their new San Francisco warehouse and assembly plant, planned for sometime in 1950.

R-B-C ROLLER FOLLOWER

With or Without Inner Races



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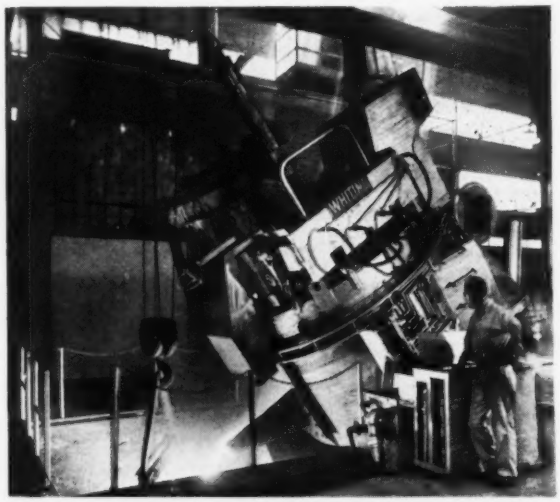
THE WEST ON ITS WAY

NEW AIRLINES COMMUNICATION — A firm named Aeronautical Radio, Inc. (code ARINC) has started operation on the Pacific Coast to take over airlines radio communication. It was originally formed for this purpose, but has for some time been engaged in negotiating frequency allocations. Developments now indicate that this firm can handle ground-air communications at a substantial cost reduction. C. A. Huntley, station manager at the Seattle-Tacoma airport, is Pacific Coast representative; Chuck Fitch is station manager at Mills Field, San Francisco; George Osborn is station manager at the Los Angeles Municipal Airport. Home office of this firm is at 1108 - 16th St., N.W., Washington 6, D. C. John Durkovic, secretary.



• New electric furnace of six tons capacity, recently installed at Los Angeles Steel Casting Co. Unit is hydraulically operated, top charge, and lapsed time from tapping the heat to power on the following heat is less than six minutes. Scrap is loaded into the charging bucket by a magnet, and accurately weighed in a special Toledo scale. Bucket is then run into foundry, where an overhead crane handles it to the furnace. Top of the furnace swings aside and, as bucket is lowered into furnace, the rope tying the orange peel bottom together burns through and the entire charge is deposited in the furnace.

COLORADO

MILLIONS FOR EDUCATION are about to be spent at University of Denver, as the second phase of its $15,000,000 program. About $4,000,000 will be spent in this phase, including: Law College building, $650,000; Engineering College building, $1,000,000; Hotel and Restaurant Management Building Student Union Building, $750,000; Communications Institute building, $1,500,000. This entire program will be financed by private gifts. Construction on this second phase is expected to start in 1950.

NEW MACARONI FACTORY will be built by American Beauty Macaroni Co. at 4550 Lipan St., Denver. It is to be a one-story factory, office, and warehouse of masonry construction.

ICE PLANT BURNS—Western Railway Ice Company at Alamosa suffered fire recently, damaging amounting to about $400,000. The plant was leveled and eight of 13 refrigerator cars of D & RGW were destroyed.

IDAHO

PAPER PLANT PROJECTED for Couer d'Alene, at a cost of about $5,000,000 by Idaho-Montana Pulp & Paper Co.,with headquarters at Missoula, Montana.

PULP AND PAPER PLANT costing about $12,000,000 will be built in Lewiston, by Potlatch Forests, Inc., part of Weyerhaeuser Timber interests.

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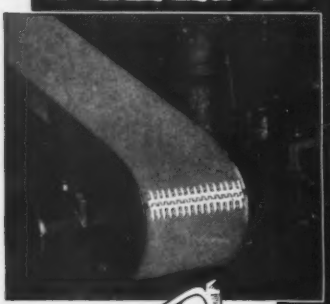

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THE WEST ON ITS WAY

ATOMIC ENERGY INFO — in three parts: (1) Bechtel Corp., San Francisco, awarded contract to perform construction work on first reactor to be built at Arco Nuclear Reacting Testing Station. Work is beginning immediately, and is scheduled for completion by late 1950. (2) AEC decided to locate the proposed materials testing reactor at Arco. Detailed design work on this reactor has been underway since last September; construction is scheduled to start by next spring. (3) Naval Proving Ground property near Arco has been transferred to AEC from the Navy Department. Construction of roads, power lines, water systems, and other facilities is moving along. The 173,000 acre site will serve as nucleus of the proposed 400,000 acre Nuclear Reactor Testing Station. Actual ownership of the property will be transferred at a later date.

MONTANA

MANGANESE DIOXIDE RESEARCH—Army signal corps and Montana State College are cooperating on research to develop a suitable manganese dioxide from domestic sources. This material has heretofore been imported from the African Gold Coast. Electrochemical processing will be directed by Dr. Lloyd Berg, head of chemical engineering, and Dr. E. W. Schilling, head of the electrical engineering department of the college.

NEW PIPELINES—Montana-Dakota Utilities Co., of Minneapolis, is authorized to lease and operate a pipeline linking the Baker Montana area with the Worland, Wyoming, source. This line will be 340 miles long, of 12¾-inch pipe.

NEVADA

MANGANESE MINES AND PLANT SOLD—Manganese Ores, including properties and facilities, northeast of Henderson, Nevada, have been sold to Manganese, Inc., for a reported $250,000 plus an additional amount for personal property involved. New construction will probably start early in 1950, costing about $750,000. New units and a newly perfected process will be installed, enabling the firm to recover an estimated 65 per cent of manganese from crude ore.

NEW MEXICO

TWO NEW POTASH MINERS—Duval Texas Sulphur Co., of Houston, Texas, has taken leases on around 13,000 acres of New Mexico state land, and plans to sink a shaft if it can get water, hoping to eliminate the need of piping water 30 or 40 miles overland. Southwest Potash Corp., of New York, has leased more than 19,000 acres near Carlsbad.

OIL COMPANY SOLD—General American Oil Co., Dallas, Texas, has arranged to buy Republic Petroleum Co., of Artesia.

OREGON

POWER PLANT MERGER—California Pacific Utilities Co. purchases the distribution lines and hydroelectric power plant of Sumpter Power and Water Co., Sumpter, Ore., one of the state's oldest utilities firms. Two benefits arise from this merger very soon: (1) customers in the Sumpter area will get a substantial rate reduction; (2) the parent company will improve power facilities so that Sumpter residents can have additional power service for home appliances.

POPE AND TALBOT MOVE—Regional headquarters of Pope & Talbot, Inc., are moved from the Union Pacific Dock, Portland, to the second floor of the commission of public docks' new office building at 3070 N.W. Front Ave. The new offices (20,000 square feet) are about twice as large as the former quarters.

COOS BAY HARDBOARD PLANT—Coos Bay Lumber Co. is installing a plant for experimental manufacture of hardboard at Coos Bay. This is a different process to turn Douglas fir into hardboard, and results of these experiments will be made available to large-scale users for research, as well as for market analysis. Output of this plant is not planned for commercial sale, but rather for test.

THE WEST ON ITS WAY

CHARCOAL FROM WOOD WASTE has proven so successful at the Phillipson Retort at Eugene, that the plant will be partly dismantled and rebuilt, expanded, on the present site at 2511 W. 11th Ave., at a cost of about $75,000. According to Carl Levy, engineer in charge of operations, that plant has proved that charcoal of any specified quality can be produced. One type consisted of only 6 per cent volatile matter and 92 per cent pure carbon. Yield is reported to be 25 per cent and better, depending on the weight of bone-dry wood waste used.

BRICK PLANT REBUILT—Columbia Brick Works has completed a $100,000 rebuilding and remodeling program at its Gresham plant. This plant was demolished by fire caused by lightning last fall.

COFFEE COMPANY CONSTRUCTS — Boyd Coffee Company purchases a full block of S. E. Belmont between 11th and 12th Aves., Portland, where they will build a $400,000 plant within a year or so. A two-story concrete structure to house roasting, processing, distribution, and office operations is projected.

IMPROVED TERMINAL FACILITIES at Portland are in the offing. Portland Commission of Public Docks purchased the government-owned part of the Willamette Iron & Steel Corp. on war-time operation, and will use this 37-acre parcel and buildings for future terminal facilities.

UTAH

BISCUITS FOR THE AREA—Weston Biscuit Co., Burbank, Calif., establishes a distributing point in the new Salt Lake industrial center, for Intermountain dealers in Utah, Idaho, and Montana. This firm makes the 33rd industry to occupy quarters in buildings of the wartime Salt Lake Ordnance plant operated by Remington Arms.

URANIUM ORE STRIKE—A new type of uranium ore (new to this country) has been located near Marysville, Utah, about 225 miles south of Salt Lake City. This ore, autunite, is next to pitchblende in its content of uranium. There are only two other known deposits of it—one in Bohemia and one in Central Africa. This new strike yields between two and ten pounds of uranium from a ton of ore. It is not known at this writing whether quantity and quality is such that a new plant will be built to process it, or whether the ore will be shipped to an existing plant for refining.

COCA COLA PLANT PURCHASED—Coca Cola Company, at Salt Lake, is purchased by William R. Felton, vice president of the Coca Cola Company, Atlanta, Georgia.

STATE MINERALS ON ROYALTY BASIS—In Utah, if move afoot by Utah state land board goes through. They propose to put all salt land leases on a royalty basis of 5 per cent of value, with a minimum of 35 cents per ton. Any lease not now carrying a royalty clause would be cancelled, under this proposition. State contention is that: (1) according to a 1948 Utah supreme court decision, the state is owner of salt and other minerals in solution in Great Salt Lake; (2) the state can realize greater revenue from these minerals on a royalty basis than on a straight annual rental basis.

FOSSIL RESIN INDUSTRY—According to Adrian Nagelvoort, a coal scientist who has a commercial resin-extracting plant at Huntington, Utah, coal beds have produced a fossil resin that might develop into a new Rocky Mountain Empire resource. This resin, used in making protective coatings, oil varnishes, spirit varnishes, paints, lacquers, inks, and linoleums, has qualities not found in any other resins in the world. It makes paint dry in 15 minutes; printing inks made from this Utah resin dry instantaneously.

WASHINGTON

MEAD MAGNESIUM PLANT PRODUCES again, after being shut down early in August. Pacific Northwest Alloys company is planning capacity production as soon as possible. 130 men who were laid off will all have been rehired when power becomes available to the company, to operate their electric furnaces. Steel strikes in the East and resulting curtailment of markets caused the temporary shutdown.

NEW VENEER FIRM FORMED, known as Renton Veneer Co., Renton, capitalized for 50,000. Incorporators are Donald W. Tyler, Seattle; Ralph N. Averill, Oroville; Donald G. Holm, Renton.

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THE WEST ON ITS WAY

ENGINE REBUILDERS MERGE—William O. McKay of Seattle and Titus Manufacturing Co., Tacoma, merge into Tam Engineering Corp., with manufacturing headquarters at 3033 So. Lawrence St. Under the new corporation, the Seattle plant is being closed and the modern new factory in Tacoma will be the only authorized Ford engine rebuilder in the Pacific northwest and Alaska district. Payroll will be increased by about 100 persons. Wm. O. McKay becomes chairman of the board, and Leon E. Titus becomes president and manager of the new firm.

PLYWOOD COOP ESTABLISHED—Mount Baker Plywood, Inc., is a newly-formed firm at Bellingham, capitalized at $1,000,000. The plant will have a capacity of 50,000,000 feet of plywood annually, and 25,000,000 feet of other wood products.

STANDARD OIL EXPANDS BULK PLANT at Seattle. Complete modernization is underway, with completion scheduled for October, 1950. Included are: 65,000 square foot warehouse, dock, garage, pump house, boiler house, loading rack, and 22 new tanks to up storage capacity by 154,000,000 barrels.

PULP PLANT EXPANDS—Puget Sound Pulp & Timber Co., Bellingham, is spending about $1,250,000 to construct a chemical cleaning unit that will enable the firm to produce a clearer, better grade of pulp and improve the firm's position in the industry. Operation of this new unit is scheduled for about next April 1.

JET-POWERED HELICOPTER has now been invented. Horace T. Pentecost, who conceived this idea, is a Seattle airman who hopes to fly it for the first time shortly after the first of the year. His 175-pound craft, called the "Firefly," has an 18-foot rotor driven by the 20-h.p. jets mounted on the rotor tips at about 500 r.p.m.

CLOVER ISLAND OIL WELL FLOWS at 650 gallons a minute, according to report. This test well is one of three constructed, intended to bolster Kennewick's municipal water system.

PASCO LOOKS SWEET TO U & I—Utah and Idaho Sugar Co., with a processing plant at Toppenish, is considering possibility of growing sugar beets in the tri-city area. Sugar beets have proven to be a very good crop in upper Yakima Valley area and Walla Walla area.

WYOMING

$1,338,000 REA LOAN has been granted to Tri-County Electric Association. It will be used to improve about 60 miles of transmission lines now built, and to build over 700 miles of new distribution lines in Crook, Weston, and Campbell counties.

500,000 TON CORDERITE DEPOSIT FOUND in the Laramie Mountains. It is described by U of Wyoming as over 100 ft. long, and is called the largest deposit in the world.

DRILLING COMPANY INCORPORATES—B. B. Carter Drilling Co., Laramie County, incorporated at $50,000 by B. B. Carter, H. M. Carter, and Harry S. Davis.

INDUSTRIAL PROPERTIES
SALES • LEASES

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WESTERNERS AT WORK

E. S. Feldman

Edward S. Feldman, administrative assistant of the Furniture Manufacturers Association of Los Angeles, appointed executive secretary of the recently reorganized Furniture Manufacturers Association of Southern California, effective January 1, 1950.

John A. Liautaud named southern district manager and **Dwight Hill,** Northwest district manager of Kerr Steamship Co., Inc., who are opening new offices in Los Angeles, Portland and Seattle.

Howard F. Isham is the new president of Western Lithograph Co., Los Angeles, succeeding **George W. Hall,** deceased. **John Davidson** becomes executive vice president.

Research and new product development at Aircraft Engineering & Maintenance Co. to be headed up by **Col. Carl J. Crame, USAF,** retired, who has been appointed director of research for that company.

William J. Price appointed industrial relations supervisor and quality engineer at the General Electric Company's Lamp Works in Oakland. Price succeeds **Richard C. Ehrman,** named a member of the staff of the manager of industrial relations at the company's Lamp Department in Cleveland, Ohio.

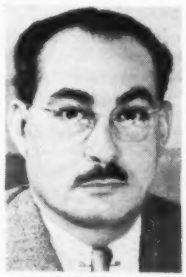
Martel Wilson chosen as the new president of the Pacific Coast Association of Port Authorities. Wilson was formerly vice president and succeeds the late **C. S. Sampson** of the Los Angeles Board of Port Commissioners. **Elmer E. Ferrari,** director of the Port of Stockton, named secretary-treasurer of the Port Commissioners' Board. Also serving on the executive committee: **Warren D. Lamport,** manager, Port of Seattle; **Robert H. Wylie,** manager, Board of State Harbor Commissioners, San Francisco; **E. J. Amar,** manager, Long Beach Harbor Department.

John W. Miller named superintendent of production planning at Kaiser Steel, succeeding **Tom Jones,** resigned.

Fred C. Bowman retires as vice president and director of research of the A. R. Maas Chemical Company. Bowman joined the company's staff in 1929 as chemical engineer and soon thereafter established the Maas Research Department. Although his retirement became effective December 31, Bowman will continue to act as consultant as his services are required by the company.

F. J. Troth becomes production superintendent for the San Joaquin division of Shell Oil Company. He replaces **R. R. Robinson,** now superintendent of Shell's coastal division. **J. R. Harman** is the new Coalinga district superintendent.

Arthur F. Kelly, for the past two years assistant to the president at Western Air Lines, Inc., elected vice president in charge of sales. Before this present position, Kelly served the company in the position of regional traffic manager for various of the Western states and Canada and was later made general traffic manager of the company.


E. V. Trapani

Edward V. Trapani appointed Constellation project engineer for Lockheed Aircraft Corporation, Burbank. Trapani has been assistant project engineer on the Constellation since its conception in 1939.

John F. Conway becomes executive assistant to president, American President Lines, succeeding **W. H. Sharon,** who becomes managing director, European division, at Genoa, on January 1. **J. E. Esney** is the new assistant to vice president, operations, San Francisco, while **H. S. Campbell** has the position of assistant to operating manager, San Francisco.

J. V. Pooler

John V. Pooler, former superintendent of Kaiser Gypsum's Long Beach plant, named manager of all the company's plants and quarries and supervisor of shipping and construction activities. **John O. Lewis,** former superintendent of the Redwood City plant, succeeds Pooler at Long Beach. **Ernie Shaper,** plant engineer at Long Beach, becomes superintendent of the Redwood City plant.

J. M. Gaylord, chief electrical engineer for the Byron Jackson Co., Pump Division, Vernon, Calif., received one of this year's *Electrical Manufacturing Magazine's* certificates of award and a cash prize of $500 for his manuscript describing the design of the company's stuffing-boxless pump and submerged electrical motor unit.

Gordon Beisel named director of research for Real Gold Citrus Products, Anaheim, California.

H. E. Bramstron-Cook appointed a vice president of Oronite Chemical Company, Standard Oil Company of California subsidiary. Bramston-Cook continues as Oronite's general manager of sales and product development work east of the Rockies, a position he has held for the past two years.

L. A. Gibbons, for nine years general counsel of Union Oil Company, elected a vice president of the company, and will continue his services as general counsel.

Dr. Clifford Houston named assistant to the president of National Motor Bearing Company, Redwood City. Dr. Houston is on six months leave from the University of Colorado.

• Newly-elected officers and directors of the California Fertilizer Association, for the ensuing year. Seated, left to right: Earl R. Mog, director and retiring president (Growers Fertilizer Co.); Dorothea M. Beidle, office secretary (Stockton, Calif.); Paul Pauly, secretary (Pacific Guano Co., Los Angeles). Seated, left to right: Byron Reynolds, director (Bandini Fertilizer Co., Los Angeles); Ralph Crum, director (Pacific Guano Co., Berkeley); J. M. Quinn, president (California Sun Fertilizer Co., Los Angeles); Charles Monoogian, director (Downey Fertilizer Co., Downey, Calif); Lowell Berry, vice president (Best Fertilizers Co., Oakland, Calif.); Wallace Macfarlane, director (Pacific Guano Co., Los Angeles); Ned Lewis, director (Wilbur-Ellis Co., Los Angeles); Elmer S. Nelson, executive secretary and manager (Calif. Fertilizer Association). Not present: Grover C. Dunford, treasurer (Inland Fertilizer Co., Los Angeles); M. C. McNeil, director (Swift & Co., Hayward).

Silicone News

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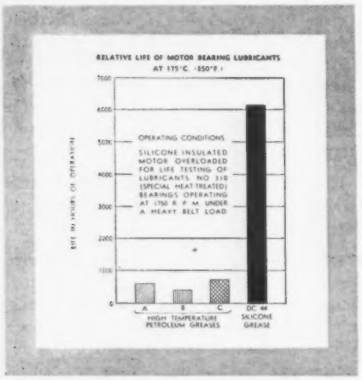
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AT 175°C. (350°F.)
OPERATING CONDITIONS
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Colorado

E. H. Roos

Edward H. Roos becomes factory manager of the C. A. Norgren Co. of Denver, Colorado. Roos was formerly with Wilson-Snyder Manufacturing Corporation, and after that served as works manager of the Imperial Division of Oilwell Supply Co. at Oil City, Penna.

Idaho

Glenn C. Lee elected president, Hope Silver Lead Mines, Inc., following a reorganization of the Clark Fork, Idaho, mine's management last week. Lee replaces **Albert M. Nash,** former president and general manager, resigned. Other new officers elected: **Edwin Groenig,** vice president; **O. W. Edmonds,** second vice president; **L. P. Larson,** secretary-treasurer.

Montana

Gerald J. Skibbins named manager of the Montana Chamber of Commerce, with offices at The Montana Club Building, Helena.

Nevada

Charles Ramsay of Los Angeles replaces **A. C. Davis** as manager of the Los Angeles Chemical Company's Ash Meadows, Nevada, clay plant.

New Mexico

Eugene M. Cramer, physical metallurgist, elected by atomic scientists at Los Alamos, New Mexico, as specialist on the staff of the industrial research division of Washington State College's institute of technology. Cramer will serve at the Los Alamos scientific laboratory.

Oregon

Charles E. Fox appointed president of the Associated Forest Industries of Oregon; **Charles E. Ogle** reappointed secretary-manager; **Thomas Brooks,** vice president; **R. E. Baker,** treasurer.

John P. Byrne appointed design and layout engineer for Iron Fireman Manufacturing Company's Portland retail branch. Byrne will assist in the layout of oil, coal and gas residential heating systems.

Utah

L. J. Westhaver

Loren J. Westhaver named manager of operations of Geneva Steel Company, succeeding **Robert G. Glass,** vice president, who becomes assistant to the president on January 1. Westhaver was formerly manager of operations for American Steel & Wire Co., another U. S. Steel subsidiary.

Washington

W. E. Johnson named assistant manager for General Electric Company's design and construction division in Richland, Wash.

Charles Baker reelected president of the Inland Empire Waterways Association. Other officers: **Herbert G. West,** executive vice president; **James H. Sturgis,** vice president for Oregon; **Roy Huffman,** vice president for Idaho; **A. C. Amon,** vice president for Washington; **Clarence Braden,** treasurer.

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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Republic Supply Co. of California appointed a distributor for the E. H. Edwards Company, manufacturer of wire rope. Republic has stores in Avenal, Bakersfield, Cuyama, Emeryville, Fresno, Gardena, Huntington Beach, Long Beach, Los Angeles, Newhall, San Jose, Santa Fe Springs, Santa Maria, Stockton, Taft, Ventura, Wilmington.

G. H. Winters

C. E. Smith

Establishment of a Northern California factory sales and service branch for **Towmotor Corporation** was the purpose of the recent visit of the company's executive vice president, **C. E. Smith,** to the West Coast. The branch, to be located at 4th and Castro Streets, Oakland, will carry complete stocks of the company's equipment and parts, and provide full service facilities. **Gordon H. Winters** has been appointed branch manager to direct and supervise the company's sales activities throughout the West.

Promotions at **Kaiser Aluminum & Chemical Sales, Inc., Oakland: C. S. French,** from central division sales manager with headquarters at Cleveland, Ohio, to a newly established post as assistant general sales manager, to work with development and specialty sales activities in connection with newer products, and with Kaiser Aluminum building products; **T. J. Gerber** to Seattle district sales manager; **A. A. Throckmorton** to manager, pig, ingot and billet sales; **C. M. Kinghorn,** product manager for rolled form sections; **J. M. Welch,** to manager of contract sales. The latter two head new departments in the Kaiser Aluminum sales headquarters at Oakland.

G. A. Shoemaker, manufacturers' representatives with headquarters at San Francisco, announce their appointment as exclusive sales representatives in Northern California and Nevada for the Specialty Tools Company of Appleton, Wisconsin, manufacturers of "Handi-Hoist."

M. M. Studebaker is the new district sales representative for **Dodge Manufacturing Company** with headquarters at 1861 N. E. 66th Ave., Portland. He will cover the territory of Washington, Oregon, Idaho, Wyoming and Montana.

American Brass Company have moved their Los Angeles office to 816 W. 5th Street, Los Angeles.

Fred G. Galer appointed sales manager for the Preservative Paint Company, Seattle manufacturing organization. Galer was with the I. F. Laucks, Inc., plant in Seattle for 12 years before he joined Preservative Paint in November.

Cost Reduction Equipment Company, which represents manufacturers of efficiency equipment and machinery, has recently moved to new quarters at 2700 West Third Street, Los Angeles.

Kaiser Steel Corporation appoint **Harry H. Beyma** as manager of cold rolled sales. He will retain offices at 756 South Spring Street, Los Angeles, in his new capacity.

S. F. Finnell, Jr., becomes Pacific Coast sales manager for the Phelps Dodge Copper Products Corporation, Los Angeles, and will make his headquarters in Los Angeles.

J. I. Hamilton named general sales manager for Menasco Manufacturing Co. at Burbank, Calif., replacing **B. C. McNeill,** resigned.

Whiting Corp., Harvey, Ill., and Los Angeles, name **Carl F. Miller & Co.,** 1217 Sixth Ave., South, Seattle, Wash., and South 121 Madison St., Spokane, agents for the varied line of Whiting foundry equipment.

A. O. Schmidt appointed manager of the Los Angeles branch of the Dickson Safety Products Company, succeeding **Gordon R. Fleming,** deceased.

W. H. Stegner chosen assistant Pacific Coast manager of the Permacel Division, Industrial Tape Corporation, with headquarters in San Francisco. Stegner previously acted as a sales representative in the Bay Area in which capacity he serviced the company's customers in the automotive and industrial trades.

American Coach and Body Co., California Division, Oakland, announce the following promotions: **E. L. Hackett, Jr.,** formerly purchasing agent, to Portland district supervisor, with headquarters in Portland. **L. F. Linn** to purchasing agent. **T. R. Hall,** former Portland district supervisor, to post of Oakland district supervisor, replacing **Henry Kipp,** resigned.

At **Fruehauf Trailer Company's** new factory branch site (Alameda and 15th Streets, Los Angeles) all facilities for expeditious trailer service are available, including a service floor where twenty-seven 35-ft. trailers can be accommodated simultaneously. The concrete and steel structure contains more than 52,000 sq. ft. of floor space on a 12-acre site.

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Send us your specifications and we will submit our recommendations.

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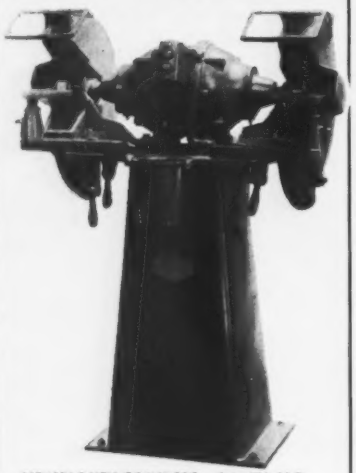
GRINDERS



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Fresno: 1837 Merced Street, 3-3277
San Jose: 201 So. Market St., CY 3-1317

L. B. Taylor

L. B. Taylor is the new general sales manager for **The Friden Calculating Machine Co., Inc.**, at San Leandro, California. Taylor was formerly Friden's domestic sales manager.

Kaiser Gypsum personnel changes: **Jerry Donoghue,** formerly district sales manager for Southern California, becomes product manager of lath and plaster. Replacing him at the Long Beach headquarters will be **Ralph Markham.**

Thomas G. Cullen announced as Western factory representative for **The Passonno-Hutcheon Co.** of Boston and Cleveland, who manufacture Rust-Sele rust preventative coatings and oils, with temporary offices at 249 Ninth Street, San Francisco. Cullen is a member of the National Association of Corrosion Engineers, and has had extensive experience in the protective coating and industrial maintenance field.

Graphic Films Corporation, Hollywood, and **Photo & Sound Productions,** San Francisco, are now associated in production of films for industry, education, and television. Films in either 16mm or 35mm may now be produced by the two companies out of both their San Francisco and Hollywood offices.

B. Thor Bjornstad has been named district engineer of **The Austin Company** in the Pacific Northwest.

Howard Burt & Sons, San Francisco, distributors of materials handling equipment, appointed exclusive Northern California distributors by **Tote Systems, Inc.,** manufacturers of "Tote" bins, a new and unique system for the economical and sanitary handling of bulk materials such as flour, sugar, corn starch, and others.

Vernon B. Jensen recently appointed as field engineer in the Northern California territory for **Gould Storage Battery Corp.** Jensen is a recent graduate of the University of Utah, and will work out of the San Francisco office.

Ira G. Perin Company, distributors of materials handling equipment, with headquarters in San Francisco, move their Los Angeles office to larger quarters at 2933 E. 11th St., Los Angeles. These new facilities will mean that larger stocks of equipment and repair parts will now be available for improved service to their customers in Southern California.

R. W. (Bob) Steinke, formerly sales engineer in the Seattle office of Goodall Rubber Company, appointed district manager for the Northern California territory, with headquarters at San Francisco.

Bearing Engineering Company, San Francisco, appointed distributor for American Pulley Company's line of Wedgebelt V-belt drives, Econ-o-matic motor bases, speed reducers and steel pulleys for flat belt drives and conveyors. Complete stocks are being established in all sizes and styles so that any power transmission requirement can be handled quickly and efficiently.

Frank Edwards appointed Northern and Central California distributor for **Stewart Warner Corp.,** Chicago radio and television manufacturers. He operates out of the Merchandise Mart, 1355 Market St.

Standard Conveyor Co. appoints **Earl W. Sutherland,** 3718 - 42nd Ave., S.W., Seattle 6, Wash., representative in that area. He will operate under his own name.

J. A. Cuneo, formerly branch manager for **Fairbanks-Morse** at Los Angeles, is transferred to Chicago to become manager of that branch. Cuneo is succeeded in Los Angeles by **A. M. McLaren.**

Louis B. Lester, Pacific Coast representative for **Motor Generator Corp.,** Hobart Bros. affiliate, announces appointment of **Rice Bros.,** Seattle and Portland, as Northwestern sales representatives.

Stanley E. Morris Co., Los Angeles, appointed exclusive southern California distributor for "Plantman" industrial floor sweepers and "Load-Set Weblock," a new, safe, and quick way to secure loads.

Howard-Cooper Corp., with headquarters in Portland and branches at Seattle, Albany, Eugene, Central Point, and Roseburg, appointed to represent **Kenworth Motor Truck Corp.** for fire truck sales and service in Washington, Oregon, Idaho, Montana, and Alaska. Besides manufacturing all types of rural and city pumping engines, Howard-Cooper Corp. represents many manufacturers of heavy duty equipment such as International Harvester Industrial Power, Pacific Car & Foundry Co., Isaacson Iron Works, Iowa Mfg. Co., J. D. Adams Co., Schram, Inc., Link Belt Speeder, and others.

J. R. B. Freeman

J. R. B. Freeman, San Francisco district manager for **Bethlehem Supply Company of California,** promoted to general manager of stores, effective the first of the year. Freeman's new headquarters will be at the company's general office in Los Angeles. **Frank T. Merkel,** sales engineer in the San Francisco office since 1940, will be district manager of the San Francisco area.

At a recent Western states distributors' meeting of **Pioneer Rubber Co.,** held in San Francisco, the following men were present: H. C. Wallace and A. L. Lanham, of Washington Belting & Rubber Company, at Tacoma and Seattle; George Novak and Abe Caniparoli, Munnell & Sherill, Inc., Portland; Roy Stevens, Intermountain Equipment Company, Spokane; Phillip A. Dufford, Intermountain Equipment Company, Boise; R. B. Kunse, Western Belting and Packing, Denver; George W. Walters, National Equipment Company, Salt Lake City.

Hyster Co. opens a new office at 4445 Third St., San Francisco, to handle sales and service.

Inter-Allied Imports, Inc., San Francisco Merchandise Mart, named West Coast distributors for **Palma & Co.,** Swiss maker of hand-blocked cotton prints and Tela cloth.

Groen Manufacturing Co., makers of stainless steel steam jacketed kettles and processing equipment, open a West Coast sales office at 420 Market St., San Francisco, under management of **F. J. Corcoran.**

Ziegler Steel Service Co., Los Angeles, appoints **Bart Smith** sales representative to handle East Los Angeles, Pasadena, Alhambra, and east through Riverside; **Edward W. Fisher** to handle downtown Los Angeles and southeastern industrial areas.

Engineering Products Company, Los Angeles, appointed exclusive Southern California distributors for the Materials Handling Division of Market Forge Company.

OPPORTUNITY SECTION

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H. C. Sweet Co., Detroit, appoint Cost Reduction Equipment Co., 2700 W. 3rd St., Los Angeles, exclusive distributors of their Florline Marking Machine in the southern California territory. This machine offers a quick and easy method of painting lines, curved or straight, on pavements, warehouse or factory floors, parking lots, garage floors, etc. By pushing this machine along designated lines, one operator can apply the paint much faster than several men could do by hand.

Hose Accessories Co., Philadelphia manufacturer of LE-HI high and low pressure hose couplings, now has a West Coast factory warehouse located at 1320 Santa Fe Ave., Los Angeles 21. Phone Vandyke 2656. They make the following appointments: East Pacific Co., 208 S.W. Stark St., Portland 4, Ore., manufacturers' representative for the Pacific Northwest territory, including Washington, Idaho, Western Montana, and British Columbia. Newton R. Crum, 206 S. El Molino, Alhambra, Calif., manufacturers' representative for California, Arizona, and Nevada.

Felt & Tarrant Mfg. Co. names Robert C. Howard manager of their Los Angeles district office. Carl A. Lomatch, Omaha district manager, succeeds Howard as district manager for the comptometer division.

Hermann H. Hobelmann is the new district representative for Westcott Chuck Co., Oneida, N. Y., to cover territories of California, Oregon and Washington and also the Reno district of Nevada.

Phillips Chemical Co., wholly-owned subsidiary of Phillips Petroleum Co., open Los Angeles offices in the Central Manufacturing District. R. B. Prock appointed district manager to handle Pacific Coast sales. Prock was formerly with Atkins, Kroll & Co., San Francisco.

Emmett L. Blair is now in charge of the dealer division of Hobart Manufacturing Company's zone No. 10, which includes California, Arizona, Nevada, and Utah, and will make his headquarters in San Francisco. He succeeds Wm. A. Hansen, transferred from San Francisco to become general sales manager of the division. Mr. Blair's former North Pacific territory of Washington, Oregon, Montana, Idaho and Wyoming has been taken over by William Hollingsworth, hitherto Troy's agent at Bakersfield, Calif.

Geoffroy Co., Denver, Colo., appointed to represent Colonial Broach in Colorado, Utah, and Wyoming.

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WESTERN INDUSTRY
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Robert M. Taylor Co., San Francisco, appointed representative for American Monorail Co., Cleveland, Ohio, in northern California exclusively.

Glen L. Codman Company, Inc. acquires the line of Lift Trucks, Inc. for Bay area distribution. Firm address is 10521 Pearmain, Oakland, Calif.

Carl Chambers appointed H. M. Harper Co.'s branch manager in Oakland, Calif. He replaces Jack Stout, who resigned to join his father in business in Chicago. Harper Co.'s Oakland office is in the Thayer Bldg., phone TEmplebar 6-2011.

The Bassick Co., division of Stewart Warner Corp., joins the Alemite Co. and the Southwind Heater Division of Stewart Warner to combine warehousing facilities and operation in order to give a new service to the distributors and jobbers of the Bassick Co. in eight Western states. Products warehoused by Bassick Co. will be a complete line of furniture casters and wheels as well as the truck casters and the new line of Alcore rubber tread hand truck wheels.

Edward R. Bacon Co. consolidates with the industrial sales division of Western Machinery Co. in northern California and Western Nevada. Headquarters remain at San Francisco; operation management is under Jack H. How, vice president of Western Machinery.

Robert Trefcer appointed Western sales manager of Sargent & Co., with office in San Francisco.

Alan Ede appointed resident salesman for Kaiser Steel Corporation, with offices in Stockton, Calif.

United Chemical Company (a new firm) has been formed in San Francisco to act as agents in most California cities for Dow Chemical Co.'s line of agricultural chemicals and allied products. A southern California sales and office warehouse will be located in Pomona under direction of Charles J. Hayward, and branches will also be maintained at Sacramento, Fresno, Bakersfield and San Jose.

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NEW EQUIPMENT
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MATERIALS HANDLING ENGINEER
In the interests of improved operation and reduced costs at its many freight terminals and warehouses, a large, well established Western motor freight company needs the permanent services of a qualified materials handling engineer, preferably graduate, and with some practical experience in the materials handling field. For the right man, the position will lead to advancement in a rapidly growing organization in the expanding motor freight industry. Write to Box 360, this magazine, setting forth qualifications, background, personal data. Candidates selected will be interviewed personally.

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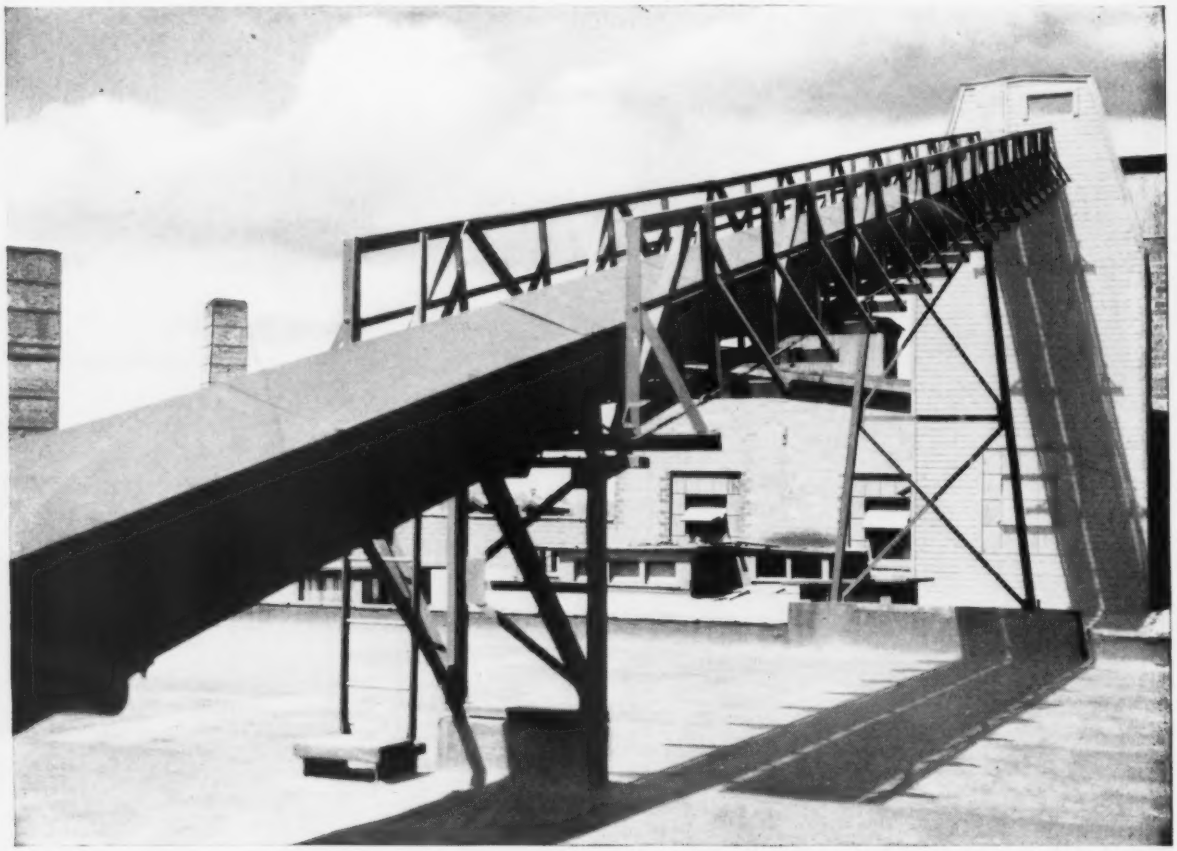

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